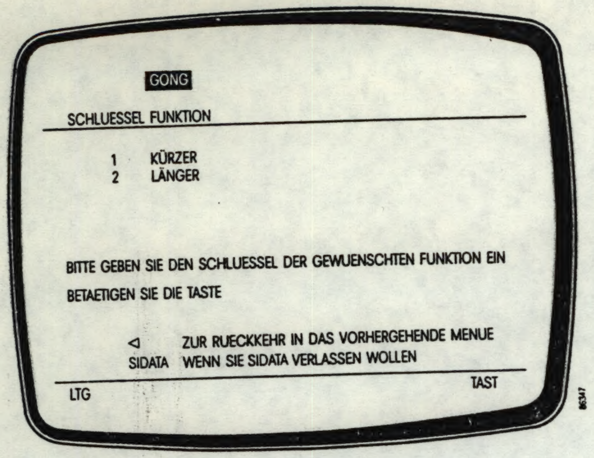
Menü GONG



```
GONG
SCHLUESSEL FUNKTION
   1   KÜRZER
   2   LÄNGER

BITTE GEBEN SIE DEN SCHLUESSEL DER GEWUENSCHTEN FUNKTION EIN
BETAETIGEN SIE DIE TASTE

     ◁       ZUR RUECKKEHR IN DAS VORHERGEHENDE MENUE
     SIDATA  WENN SIE SIDATA VERLASSEN WOLLEN
LTG                                              TAST
```

1 Mit dieser Taste wählen Sie das Menü GONG.

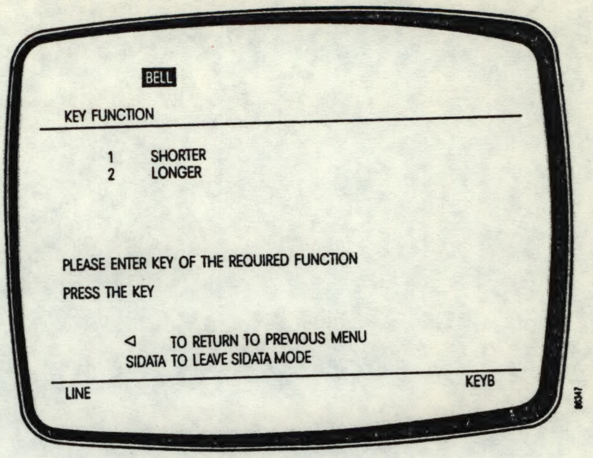
➧ Die Gongdauer läßt sich in mehreren Stufen verändern und kann unmittelbar mitgehört werden.

So stellen Sie weitere Betriebsparameter ein:

☐ Taste **◁** drücken.

Jetzt sind Sie wieder im SIDATA-Grundmenü.

BELL menu



```
BELL
KEY FUNCTION
   1   SHORTER
   2   LONGER

PLEASE ENTER KEY OF THE REQUIRED FUNCTION
PRESS THE KEY

     ◁      TO RETURN TO PREVIOUS MENU
     SIDATA TO LEAVE SIDATA MODE
LINE                                       KEYB
```

1 You can select the BELL menu with this key.

➧ A number of options for the duration of the warning bell can be selected, with direct monitoring of the current setting being possible.

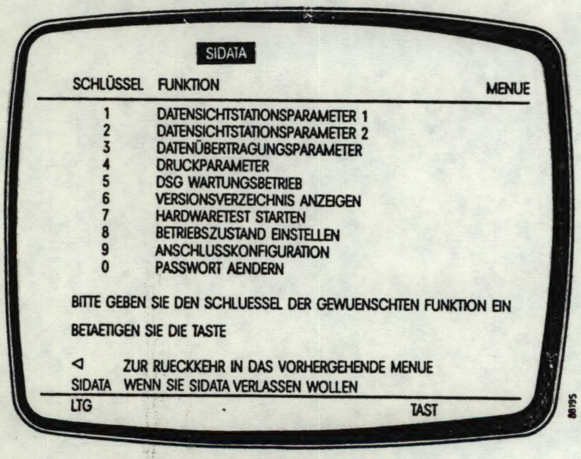
Further operating parameters are set as follows:

☐ Press the **◁** key.

This returns you to the basic SIDATA menu.

4.2 SIDATA-Einstellmenü

Das Menü ist selbsterklärend und führt Sie durch die einzelnen Untermenüs (SCHLÜSSEL).



```
SIDATA
SCHLÜSSEL  FUNKTION                                   MENUE
   1   DATENSICHTSTATIONSPARAMETER 1
   2   DATENSICHTSTATIONSPARAMETER 2
   3   DATENÜBERTRAGUNGSPARAMETER
   4   DRUCKPARAMETER
   5   DSG WARTUNGSBETRIEB
   6   VERSIONSVERZEICHNIS ANZEIGEN
   7   HARDWARETEST STARTEN
   8   BETRIEBSZUSTAND EINSTELLEN
   9   ANSCHLUSSKONFIGURATION
   0   PASSWORT AENDERN
BITTE GEBEN SIE DEN SCHLUESSEL DER GEWUENSCHTEN FUNKTION EIN
BETAETIGEN SIE DIE TASTE
◁       ZUR RUECKKEHR IN DAS VORHERGEHENDE MENUE
SIDATA  WENN SIE SIDATA VERLASSEN WOLLEN
LTG                                            TAST
```

So erreichen Sie das Einstellmenü:

Wenn Sie sich im Grundmenü SIDATA befinden,

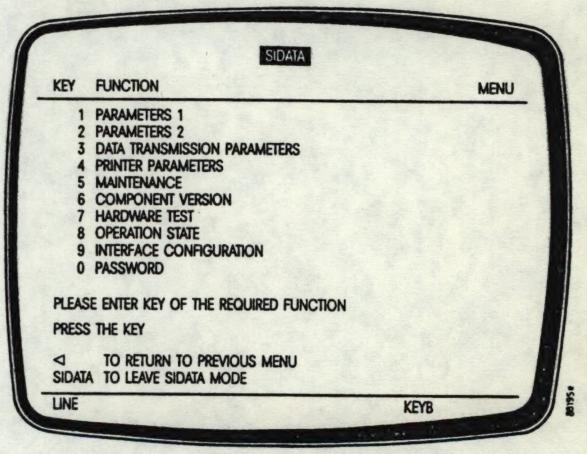
☐ Zifferntaste **0** drücken und

☐ ein achtstelliges Paßwort[1] eingeben.
Vom Werk wurde als Paßwort "SIEMENS␣[2]" eingestellt.

☐ Den gewünschten Schlüssel wählen.

4.2 SIDATA Setting Menu

The menu is self-explanatory and will guide you through the individual sub-menus (KEY).



```
SIDATA
KEY  FUNCTION                                   MENU
   1 PARAMETERS 1
   2 PARAMETERS 2
   3 DATA TRANSMISSION PARAMETERS
   4 PRINTER PARAMETERS
   5 MAINTENANCE
   6 COMPONENT VERSION
   7 HARDWARE TEST
   8 OPERATION STATE
   9 INTERFACE CONFIGURATION
   0 PASSWORD
PLEASE ENTER KEY OF THE REQUIRED FUNCTION
PRESS THE KEY
◁       TO RETURN TO PREVIOUS MENU
SIDATA  TO LEAVE SIDATA MODE
LINE                                      KEYB
```

The setting menu is selected as follows:

From the basic SIDATA menu,

☐ press the numeric key **0** and

☐ enter an eight-digit password[1]
The ex-works password is "SIEMENS␣[2]"

➧ Select the desired key.

---

[1] Über das Menü "PASSWORT AENDERN" können Sie das Paßwort ändern.

[2] ␣ = Leerzeichen

[1] You can alter your password via the "PASSWORD" menu.

[2] ␣ = blank

Schlüssel zum Menü (Auswahl)

1 DATENSICHTSTATIONSPARAMETER 1

1 BILDVERWEILZEIT

Erfolgt über längere Zeit (ca. 10 Min.) keine Eingabe, kann der Bildschirm dunkelgesteuert werden. Damit wird die Bildröhre vor Einbrennen geschützt.

2 DEZIMALSTELLENTRENNUNG

Im Zehnerblock kann zwischen Punkt "." und Komma "," gewählt werden.

3 DARSTELLUNG ZEICHENPLATZ BEI GELÖSCHTEM BILDBEREICH

Sie können bei gelöschtem Bildbereich zwischen Nil "." und Blank "␣" wählen.

4 DARSTELLUNG DER SCHREIBMARKE

Die Darstellung der Schreibmarke kann variiert werden:

Zeichen invers nicht blinkend
Zeichen invers blinkend
Zeichen unterstrichen nicht blinkend
Zeichen unterstrichen blinkend

Key to menu (excerpts)

1 PARAMETERS 1

1 SCREEN DURATION

If nothing is entered for a prolonged period of time (approx. 10 min.) the screen can be blanked in order to protect the CRT.

2 DECIMAL SEPARATOR

On the numeric keypad you can choose between the period "." and the comma "," as the decimal separator.

3 CLEARED SCREEN CHARACTER

You can choose between the nil character "." and the blank "␣" for the representation of erased screen areas

4 CURSOR FORM

You have the option of selecting various cursor forms:

Character inverse, non-flashing
Character inverse, flashing
Character underlined, non-flashing
Character underlined, flashing

5 DARSTELLUNG DER EMPFANGENEN NACHRICHT

Sie können wählen zwischen:

Verarbeitung der Nachricht sichtbar
Bild wechselt nach Verarbeitung.

7 P-TASTENSPEICHER

Der Inhalt der P-Tasten kann gespeichert werden oder geht mit dem Ausschalten der Steuereinheit verloren.

8 BETRIEBSART BEIM BILDROLLEN

Das Bild wird zeilenweise/langsam verschoben.

5 DISPLAY DURING RECEIVE

You can choose between:

Visible processing of the message
Image modification after processing

7 PUSH KEY HANDLING

The contents of the P-keys can either be stored or allowed to lapse upon switching off the control unit.

8 SCROLLING

The screen contents are shifted line-by-line or at reduced speed (scroll/softscroll).

Schlüssel zum Menü (Auswahl)
2 DATENSICHTSTATIONSPARAMETER 2

1 SCHRIFTDARSTELLUNG

Folgende Darstellungen sind möglich:

Zeichen dunkel, Hintergrund hell (Positiv)
Zeichen hell, Hintergrund dunkel (Negativ)

2 UNTERSTRICHEN/INVERS

Um Zeichen hervorzuheben, können Sie diese unterstreichen oder invers darstellen.

5 TASTATURVARIANTE und 6 ZEICHENSATZVARIANTE

Hier können Sie beliebig wählen, wobei jedoch der Zeichensatz der gewählten Tastaturvariante entsprechen sollte.

9 EM 97801 BILDAUFBAU

Enthält Ihre Datensichtstation den optionalen SINIX-Anschluß, können Sie wählen zwischen:
97801 A: für schnellen Bildaufbau, wobei die Zeichensätze FACET und KLAMMERN nur eingeschränkt benutzbar sind, und
97801 G: für normalen Bildaufbau ohne Einschränkung bei den Zeichensätzen.

Key to menu (excerpts)
2 PARAMETERS 2

1 CHARACTER DISPLAY

The following modes of representation are possible:

Dark characters on a light background (positive)
Light characters on a dark background (negative)

2 UNDERLINE/INVERSE

To make characters stand out, they can be underscored or displayed in inverse video form.

5 KEYBOARD VERSION and 6 CHARACTERSET

Here you have your choice of options, however, the characterset should correspond to the particular keyboard version.

9 EM 97801 SCREEN MODE

If your data display terminal comprises the optional SINIX interface, you may choose between
97801 A for fast display formatting, with restricted use of the character sets FACET and KLAMMERN and
97801 G for normal display formatting without character set restrictions.

Schlüssel zum Menü (Auswahl)
3 DATENÜBERTRAGUNGSPARAMETER (nur für HDLC-Anschluß)

1 ADRESSE

Bei Adresse "FF" wird jede vom Kommunikationsrechner ausgegebene Adresse akzeptiert. Jede anders eingestellte Adresse muß mit der Generierung im Kommunikationsrechner übereinstimmen.
Theoretisch mögliche Einstellungen: 01 – FE

➧ Jede Adresse muß zweistellig im Hexadezimal-Code eingegeben werden.

2 FRAMEGRÖSSE

Die Framegröße gibt die Größe der zum Kommunikationsrechner übertragenen Blöcke an.

Minimaleinstellung
100 Hex entspricht 256 Zeichen
Maximaleinstellung (Standard):
1000 Hex entspricht 4×1024 Zeichen = 4 Kbyte

3 FENSTERGRÖSSE

Mit dieser Größe legen Sie fest, wieviel Blöcke ausgesendet werden, bis der erste zum Kommunikationsrechner ausgesendete Block quittiert wird.

Standardeinstellung: 1 (Block)
Maximaleinstellung: 7 (Blöcke)

Key to menu (excerpts)
3 DATA TRANSMISSION PARAMETERS (HDLC connection only)

1 ADDRESS

With address "FF", any address output from the communication computer will be accepted. Any differently set address must tally with the generation in the communication computer. Theoretically possible settings: 01 – FE.

➧ Each address must be specified as a two-digit hexadecimal code value.

2 FRAME SIZE

The frame size specifies the size of the blocks transmitted to the communication computer.

Lowest setting
100 Hex represents 256 characters
Maximum setting (standard):
1000 Hex represents 4 × 1024 characters = 4 Kbyte

3 WINDOW SIZE

With this value the user can specify how many blocks are to be transmitted before the first block transmitted to the communication computer is acknowledged.

Default setting: 1 (block)
Maximum setting: 7 (blocks)

4 ANZAHL DER WIEDERHOLUNGEN BEI DATENÜBERTRAGUNG

Die Anzahl der Wiederholungen bei Datenübertragungsstörungen wird angegeben.

Standardeinstellung: 3 (Wiederholungen)
Maximaleinstellung: 7 (Wiederholungen)

5 ANZAHL DER WIEDERHOLUNGEN BEI WÄHLNETZEN*)

Die Anzahl der Rufwiederholungen bei Wählnetzen wird festgelegt.

Standardeinstellung: 3 (Wiederholungen)
Maximaleinstellung: 7 (Wiederholungen)

6 RUFNUMMERN EINGEBEN*)

Es können bis zu fünf Rufnummern gespeichert werden.

7 RUFNUMMERN AUSWÄHLEN*)

Es kann eine der fünf Rufnummern ausgewählt werden.

8 GESCHWINDIGKEIT

Es lassen sich sechs verschiedene Geschwindigkeiten einstellen.
Standardeinstellung: 38,4 kBaud

4 NUMBER OF RETRIES WITH DATA TRANSMISSION

This specifies the number of repetitions in the event of data transmission interference.

Default setting: 3 (repetitions)
Maximum setting: 7 (repetitions)

5 NUMBER OF RETRIES WITH DIALING*)

This specifies the number of retries in the case of dialed calls.

Default setting: 3 (repetitions)
Maximum setting: 7 (repetitions)

6 DEFINE TELEPHONE NUMBER*)

Up to five call numbers can be stored.

7 SELECT TELEPHONE NUMBER*)

One of the five call numbers may be selected.

8 DATA TRANSMISSION RATE

Six different transmission rates can be selected.
Default setting: 38.4 kBaud

---

*) Diese Einstellungen sind nur bei Wählverbindungen im Datex-Netz von Bedeutung.

*) These settings are important only in the case of dialup connections in the DATEX network.

Schlüssel zum Menü
4 DRUCKPARAMETER

1 DRUCKERSTEUERZEICHEN

Für jeden lokalen Druckeranschluß können ein Formularvorschub oder eine Anzahl von Zeilenvorschüben bei Druckbeginn eingestellt werden.

2 DRUCKPARAMETER FUER TASTE DRUCKEN 1

1 DRUCKFORMAT*)

Sie können zwischen Hardcopy und Formulardruck wählen. Bei Hardcopy werden die notwendigen Druckersteuerzeichen vom Gerät erzeugt.
Bei Formulardruck müssen die Druckersteuerzeichen vom Rechner ausgegeben werden.

2 DRUCKERAUSWAHL*)

Wenn an einem Drucker, der an der gleichen Mehrfachsteuerung wie die Datensichtstation angeschlossen ist, ausgedruckt werden soll, muß die Kanaladresse an der Mehrfachsteuerung eingestellt werden.

Key to menu
4 PRINTER PARAMETERS

1 PRINTER COMMANDS

For each local interface a form-feed or a number of linefeeds can be selected at the start of printing.

2 PRINTER PARAMETERS FOR PRINTKEY 1

1 PRINT FORMAT*)

You can choose between hardcopy and forms printing. In the case of hardcopy, the requisite control characters are generated by the device.
If the form printing option is selected, the printer control characters must be output by the computer.

2 PRINTER CHOICE*)

If it is intended to print data on a printer connected to the same cluster controller as the data display terminal, the channel address must be set on the cluster controller.

---

*) Diese Einstellungen werden aus Kompatibilitätsgründen mit dem Ausschalten gelöscht.

*) On grounds of compatibility these settings are cancelled when the device is switched off.

3 DRUCKERADRESSZUWEISUNG

In diesem Menü wird je einer Geräteadresse (GAD 1 bis 7) einer der sieben Anschlüsse zur Druckerausgabe zugewiesen. An diesem Anschluß muß dann ein Drucker angeschlossen sein. Der anzuschließende Drucker läßt sich im Menü "Anschlußkonfiguration" festlegen.

Sollen mehrere lokale Drucker angeschlossen werden, ist die Zuweisung der Geräteadressen (GAD 1 bis 7) zu den Peripherie-Anschlüssen 1 bis 7 mit dem Systemverwalter zu vereinbaren.

Im Lieferzustand sind alle GAD 1 bis 7 dem Anschluß 5 zugewiesen. Ohne Änderung der Zuweisung ist der Anschluß 5 für die Druckerfunktion zu verwenden.

3 PRINTER DEVICE SELECTION

With this menu, each device address (DEV 1 to 7) is assigned one of the seven interfaces for printer output. A printer is then to be connected to this interface. The printer to be connected can be defined in the menu "Connection Configuration".

If several local printers are to be connected, the assignment of the device addresses (DEV 1 to 7) to the peripheral interfaces 1 to 7 is to be agreed upon with the system administrator.

The unit is delivered with all DEVs 1 to 7 assigned to interface 5. Interface 5 is to be used for the printer function without changing the assignment.

Menü 5 DSG WARTUNGSBETRIEB

Dieses Menü ist nur von Service-Technikern aufzurufen.

Menü 6 VERSIONSVERZEICHNIS ANZEIGEN

Das Versionsverzeichnis gibt Auskunft über Titel, Version und Versionsdatum Ihres Steuerprogramms (DSG-Programm, Anschluß-Programme).

Menü 7 HARDWARETEST STARTEN

Dieses Menü gibt Auskunft über die Betriebsbereitschaft Ihrer Hardware.

Menü 8 BETRIEBSZUSTAND EINSTELLEN

Schlüssel 1:
Hier legen Sie fest, welches Betriebssystem nach dem Einschalten des Gerätes erscheinen soll:
TRANSDATA (Lieferzustand) oder
SINIX

Schlüssel 2:
Hier stellen Sie den ursprünglichen Lieferzustand wieder her (z.B. nach fehlerhaften Einstellungen).

Menu 5 MAINTENANCE

This menu is only called by service engineers.

Menu 6 COMPONENT VERSION

The version directory provides information on the title, version number and version date of your control program (VDU program, interfacing programs).

Menu 7 HARDWARE TEST

This menu provides information on the current operability of your hardware.

Menu 8 DELIVERY STATE

Key 1:
Here you determine which operating system is to appear after the device has been activated:
TRANSDATA (delivery status) or SINIX

Key 2:
Here you reestablish the original delivery status (e.g. after faulty settings).

Menü 9 ANSCHLUSSKONFIGURATION

In diesem Menü kann den Anschlüssen 1 bis 7 ein Peripheriegerät zugewiesen werden.

Vorzugsweise zuzuordnen sind:
- Drucker 90xx dem Anschluß 5
- Ausweisleser 9007 dem Anschluß 4.

Die Anschlüsse 6/7 sind für SINIX vorgesehen:
- EM97801 für Systemdaten,
- DT97801 für SINIX-Druckdaten an den lokalen Drucker.

Drucker sind vorzugsweise mit Gerätekennung bzw. Statusmeldung zu betreiben. Dies entspricht den Menüfunktionen (z.B. DR9011).
Ausnahme (z.B. Drucker 9001-31):
- mit Kennung: Funktion DR9013 einstellen
- ohne Kennung: Funktion DR9001 einstellen.

Hinweise zum Schlüssel "0 Interruptzuweisung":
Den Anschlüssen 4/5 und 6/7 sind Interrupts und eine Basis-Portadresse zuzuweisen.

Mögliche Einstellungen:
Ein Interrupt bei 2x SS97:
03, 04, 05, 06, 07 für Anschlüsse 4/5
Zwei Interrupts bei 4x SS97:
03, 04, 05, 06, 07, 10, 11, 12, 15 für die Anschlüsse 4/5 und 6/7
Basis-Portadresse: 380, 388, 3A0, 3A8

Menu 9 PORT CONFIGURATION

In this menu a peripheral device can be assigned to interface 1 through 7.

Preferential assignments are:
- 90xx Printer to interface 5
- 9007 ID card reader to interface 4.

Interfaces 6/7 are provided for SINIX:
- EM97801 for system data.
- DT97801 for SINIX print data to the local printer.

Printers are to be operated with device identification or status message, if possible. This corresponds to the menu functions (e.g. DR9011).
Exception (e.g. 9001-31 Printer):
- with identification: set function DR9013
- without identification: set function DR9001

Notes on key function "0 INTERRUPT SELECTION":
Interrupts and a basic port address are to be assigned to interfaces 4/5 and 6/7.

Possible settings:
One interrupt in the case of 2x interface 97:
03, 04, 05, 06, 07 for interfaces 4/5
Two interrupts in the case of 4x interface 97:
03, 04, 05, 06, 07, 10, 11, 12, 15 for interfaces 4/5 and 6/7
Basic port address: 380, 388, 3A0, 3A8

Lieferzustand:
Interrupt 04 für die Anschlüsse 4/5
Interrupt 12 für die Anschlüsse 6/7
Basis-Portadresse: 380
Bei ausschließlichem TRANSDATA/SINIX-Betrieb ist keine Änderung erforderlich.

Wenn der PC-Hochrüstsatz eingebaut ist, muß für die Anschlüsse 4/5 der Interrupt von 04 in 15 geändert werden.
- Dazu muß die Option 4x SS97 vorhanden sein; bei der Option 2x SS97 ist dies nicht möglich.

! Änderungen im Menü müssen mit den Einstellungen auf dem jeweiligen Anschlußsatz in der Systemeinheit übereinstimmen.

Delivery status:
Interrupt 04 for interfaces 4/5
Interrupt 12 for interfaces 6/7
Basic port address: 380
In the case of exclusive TRANSDATA/SINIX operation, no resetting is required.

If the PC upgrade kit is integrated, the interrupt must be shifted from 04 to 15 for interfaces 4/5
- To be able to do so, option 4x interface 97 must be provided; in the case of option 2x interface 97 this is not possible.

! Menu changes must comply with the settings on the respective interface set in the system unit.

Menü 0 PASSWORT ÄNDERN

Sie können das vom Werk eingestellte Paßwort "SIEMENS␣" ändern.
Das Paßwort muß achtstellig sein. Erlaubt sind Groß- und Kleinbuchstaben, Ziffern und Sonderzeichen.

Menu 0 PASSWORD

You can alter the password set at the factory, in this case "SIEMENS␣".
The password must consist of eight characters, comprising uppercase and lowercase alphabetics, numerics and special characters.

SIEMENS

TRANSDATA
Data Display Terminals
Code Tables

User's Guide

Edition July 1990

Order No. U6218-J-Z75-1-7600
Printed in the Federal Republic of Germany
1410 AG 990.3 (1770)

A ring binder for this manual
is available ata a cost of DM 5.00.
Order number: U3712-J-Z18-1

TRANSDATA
Data Display Terminals
Code Tables

User's Guide

Edition July 1990

Order No. U6218-J-Z75-1-7600
Printed in the Federal Republic of Germany
1410 AG 990.3 (1770)

The reproduction, transmission or use of this document or its contents is not permitted without express written authority.

Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

Delivery subject to availability;
© Siemens AG 1990

Published by Bereich
Daten- und Informationstechnik
Postfach 83 09 51, D-8000 München 83

Siemens Aktiengesellschaft

Preface

This manual is intended to supplement the manual entitled "TRANSDATA Data Display Terminals, Functional Description" [1]. It describes all the codes required for programming the data display terminals and for data exchange with printers.

For whom is this manual designed?

The contents of this manual are intended for the experienced programmer wishing to

- program outputs to data display terminals and printers,
- correctly interpret and evaluate messages from data display terminals and printers.

What do you need to know?

Previous experience of programming data display terminals and printers is necessary.

Note

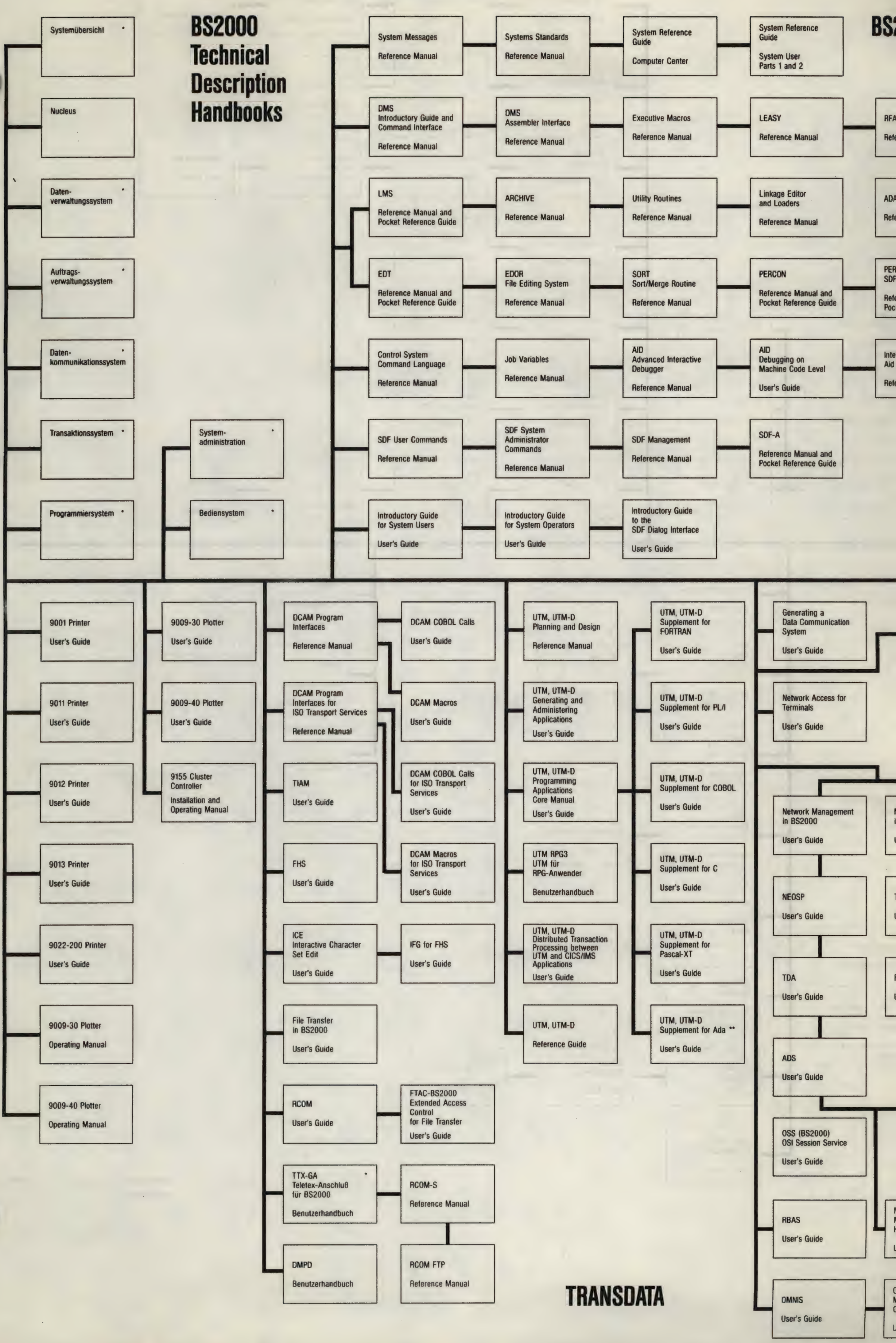
> Programming of data display terminal functions in application programs can be carried out only in the manner described in this manual.

An appeal to the reader

Please let us know what you think of this manual. If you are satisfied, then we know we are on the right track; if not, let us know where the stumbling blocks are so that we can take steps to eliminate them and improve our documentation. Reply forms are provided at the end of the manual for this purpose.

User Documentation Department DI ST QM 2

BS2000 Technical Description Handbooks



Systemübersicht •

Nucleus

Daten-
verwaltungssystem •

Auftrags-
verwaltungssystem •

Daten-
kommunikationssystem •

Transaktionssystem •

Programmiersystem •

System-
administration •

Bediensystem •

System Messages
Reference Manual

Systems Standards
Reference Manual

System Reference
Guide
Computer Center

System Reference
Guide
System User
Parts 1 and 2

DMS
Introductory Guide and
Command Interface
Reference Manual

DMS
Assembler Interface
Reference Manual

Executive Macros
Reference Manual

LEASY
Reference Manual

LMS
Reference Manual and
Pocket Reference Guide

ARCHIVE
Reference Manual

Utility Routines
Reference Manual

Linkage Editor
and Loaders
Reference Manual

EDT
Reference Manual and
Pocket Reference Guide

EDOR
File Editing System
Reference Manual

SORT
Sort/Merge Routine
Reference Manual

PERCON
Reference Manual and
Pocket Reference Guide

Control System
Command Language
Reference Manual

Job Variables
Reference Manual

AID
Advanced Interactive
Debugger
Reference Manual

AID
Debugging on
Machine Code Level
User's Guide

SDF User Commands
Reference Manual

SDF System
Administrator
Commands
Reference Manual

SDF Management
Reference Manual

SDF-A
Reference Manual and
Pocket Reference Guide

Introductory Guide
for System Users
User's Guide

Introductory Guide
for System Operators
User's Guide

Introductory Guide
to the
SDF Dialog Interface
User's Guide

9001 Printer
User's Guide

9011 Printer
User's Guide

9012 Printer
User's Guide

9013 Printer
User's Guide

9022-200 Printer
User's Guide

9009-30 Plotter
Operating Manual

9009-40 Plotter
Operating Manual

9009-30 Plotter
User's Guide

9009-40 Plotter
User's Guide

9155 Cluster
Controller
Installation and
Operating Manual

DCAM Program
Interfaces
Reference Manual

DCAM COBOL Calls
User's Guide

DCAM Program
Interfaces for
ISO Transport Services
Reference Manual

DCAM Macros
User's Guide

TIAM
User's Guide

DCAM COBOL Calls
for ISO Transport
Services
User's Guide

FHS
User's Guide

DCAM Macros
for ISO Transport
Services
User's Guide

ICE
Interactive Character
Set Edit
User's Guide

IFG for FHS
User's Guide

File Transfer
in BS2000
User's Guide

RCOM
User's Guide

FTAC-BS2000
Extended Access
Control
for File Transfer
User's Guide

TTX-GA •
Teletex-Anschluß
für BS2000
Benutzerhandbuch

RCOM-S
Reference Manual

DMPD
Benutzerhandbuch

RCOM FTP
Reference Manual

UTM, UTM-D
Planning and Design
Reference Manual

UTM, UTM-D
Generating and
Administering
Applications
User's Guide

UTM, UTM-D
Programming
Applications
Core Manual
User's Guide

UTM RPG3
UTM für
RPG-Anwender
Benutzerhandbuch

UTM, UTM-D
Distributed Transaction
Processing between
UTM and CICS/IMS
Applications
User's Guide

UTM, UTM-D
Reference Guide

UTM, UTM-D
Supplement for
FORTRAN
User's Guide

UTM, UTM-D
Supplement for PL/I
User's Guide

UTM, UTM-D
Supplement for COBOL
User's Guide

UTM, UTM-D
Supplement for C
User's Guide

UTM, UTM-D
Supplement for
Pascal-XT
User's Guide

UTM, UTM-D
Supplement for Ada **
User's Guide

Generating a
Data Communication
System
User's Guide

Network Access for
Terminals
User's Guide

Network Management
in BS2000
User's Guide

NEOSP
User's Guide

TDA
User's Guide

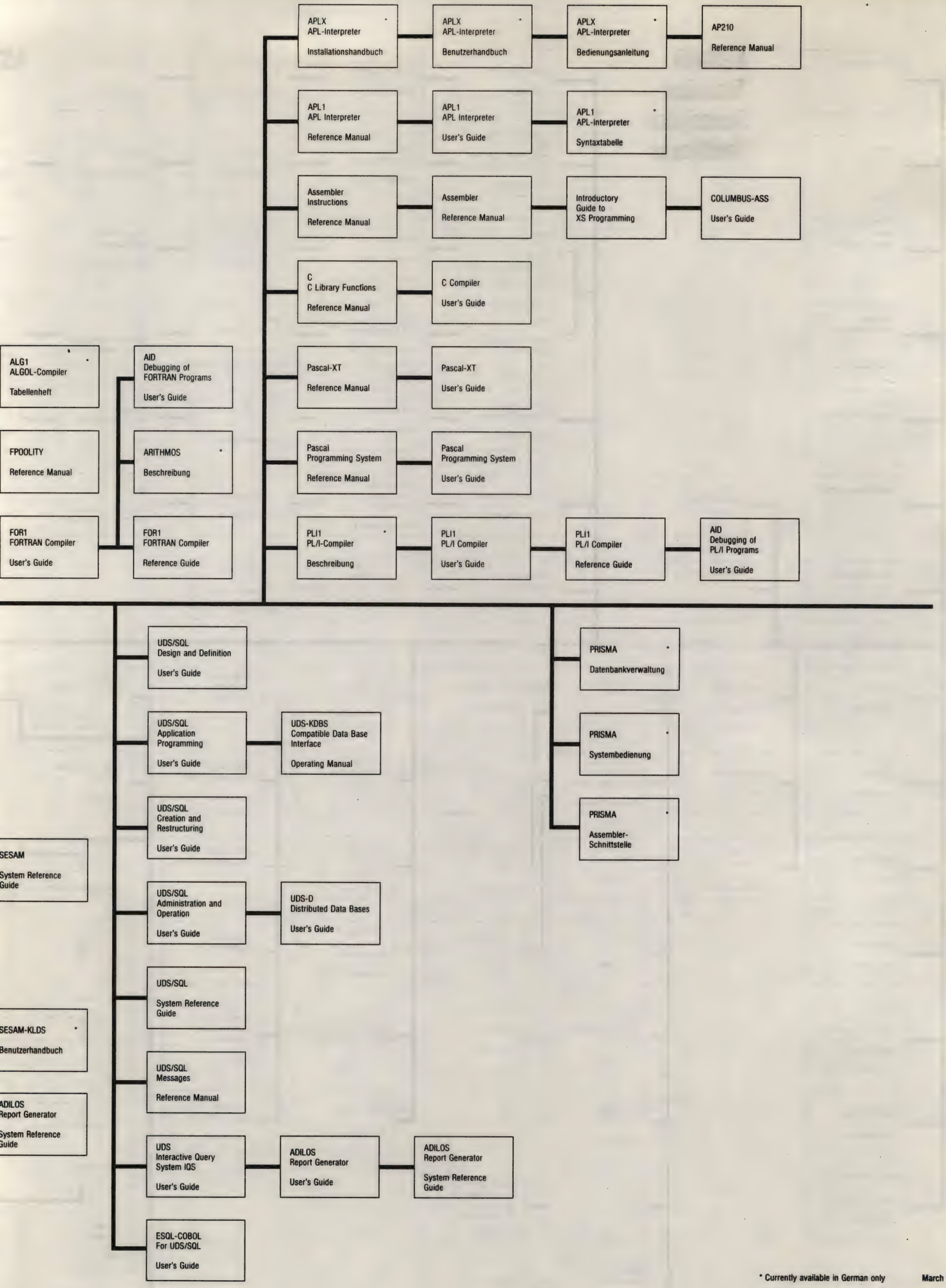
ADS
User's Guide

OSS (BS2000)
OSI Session Service
User's Guide

RBAS
User's Guide

OMNIS
User's Guide

TRANSDATA


APLX APL-Interpreter Installationshandbuch *
APLX APL-Interpreter Benutzerhandbuch *
APLX APL-Interpreter Bedienungsanleitung *
AP210 Reference Manual
APL1 APL Interpreter Reference Manual
APL1 APL Interpreter User's Guide
APL1 APL-Interpreter Syntaxtabelle *
Assembler Instructions Reference Manual
Assembler Reference Manual
Introductory Guide to XS Programming
COLUMBUS-ASS User's Guide
C C Library Functions Reference Manual
C Compiler User's Guide
ALG1 ALGOL-Compiler Tabellenheft *
AID Debugging of FORTRAN Programs User's Guide
Pascal-XT Reference Manual
Pascal-XT User's Guide
FPOOLITY Reference Manual
ARITHMOS Beschreibung *
Pascal Programming System Reference Manual
Pascal Programming System User's Guide
FOR1 FORTRAN Compiler User's Guide
FOR1 FORTRAN Compiler Reference Guide
PLI1 PL/I-Compiler Beschreibung *
PLI1 PL/I Compiler User's Guide
PLI1 PL/I Compiler Reference Guide
AID Debugging of PL/I Programs User's Guide
UDS/SQL Design and Definition User's Guide
PRISMA Datenbankverwaltung *
UDS/SQL Application Programming User's Guide
UDS-KDBS Compatible Data Base Interface Operating Manual
PRISMA Systembedienung *
UDS/SQL Creation and Restructuring User's Guide
PRISMA Assembler-Schnittstelle *
SESAM System Reference Guide
UDS/SQL Administration and Operation User's Guide
UDS-D Distributed Data Bases User's Guide
UDS/SQL System Reference Guide
SESAM-KLDS Benutzerhandbuch *
UDS/SQL Messages Reference Manual
ADILOS Report Generator System Reference Guide
UDS Interactive Query System IQS User's Guide
ADILOS Report Generator User's Guide
ADILOS Report Generator System Reference Guide
ESQL-COBOL For UDS/SQL User's Guide

* Currently available in German only

** In preparation

March 1990

4 SIDATA-Menüs

Bei der Datensichtstation 9763-M können Sie Betriebsparameter Ihren Wünschen entsprechend einstellen.

Die veränderten Werte werden nur so wirksam:

- ☐ SIDATA-Einstellbetrieb verlassen,
- ☐ warten, bis die grüne Anzeige am Diskettenlaufwerk erlischt.

! Während die grüne Anzeige am Diskettenlaufwerk leuchtet:
– Diskette nicht entnehmen!
– Gerät nicht ausschalten!

CTRL und K2 gleichzeitig drücken.

Nach ca. 30 Sekunden hat die Datensichtstation wieder ihren Betriebszustand erreicht (wie beim Einschalten).

Die benötigten Tasten ergeben sich aus den ausgewählten Menütafeln.

➧ Werden unzulässige Tasten benutzt, ertönt ein Gong, soweit nicht über Menü ausgeschaltet.

4 SIDATA Menus

The 9763-M Data Display Terminal allows you to set operating parameters to suit your particular requirements.
The changed settings become effective only if you:

- ☐ leave the SIDATA setting mode,
- ☐ wait until the green indicator on the disk drive goes out.

! If the green indicator on the disk drive flashes:
– Do not remove floppy disk!
– Do not switch off device!

Press the CTRL and K2 keys simulaneously.

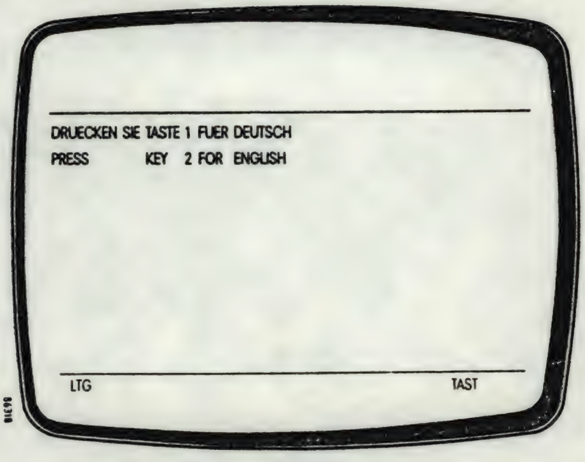
After approx. 30 seconds, the data display terminal has once again reached its operation status (as during activation).

The required keys can be derived from the selected menu panels.

➧ If invalid keys are used, a warning bell sounds (except when the bell was deactivated via the menu).

4.1 Sprachauswahl und Grundmenü

4.1 Language Selection and the Basic Menu



DRUECKEN SIE TASTE 1 FUER DEUTSCH
PRESS KEY 2 FOR ENGLISH

Die Sprachauswahl erscheint, wenn Sie folgende Tasten in der angegebenen Reihenfolge drücken:

SHIFT + SIDATA P1...P20
+
reset Anzeigen

Jetzt können Sie die gewünschte Sprache einstellen.

Das folgende SIDATA-Grundmenü erscheint automatisch in der von Ihnen gewählten Sprache.

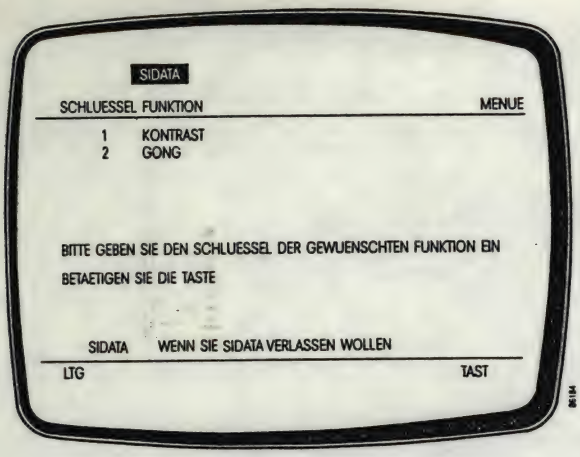
The language selection mask will be displayed if you press the following keys in the order specified:

SHIFT + SIDATA P1...P20
+
reset Anzeigen

You can now select the desired language.

The following basic menu will appear automatically, in the language you have specified.

Grundmenü einschalten ohne vorherige Sprachauswahl.



```
                SIDATA
SCHLUESSEL FUNKTION                              MENUE
     1      KONTRAST
     2      GONG

BITTE GEBEN SIE DEN SCHLUESSEL DER GEWUENSCHTEN FUNKTION EIN
BETAETIGEN SIE DIE TASTE

   SIDATA    WENN SIE SIDATA VERLASSEN WOLLEN
LTG                                              TAST
```

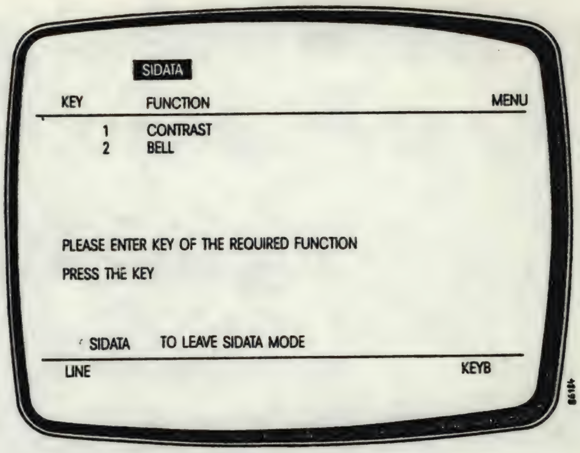
☐ Mit den Tasten SHIFT + SIDATA P1...P20 SIDATA-Grundmenü einschalten.

☐ Den gewünschten Schlüssel mit der Zifferntaste 1 oder 2 wählen.

Die gewählte Funktion wird invers dargestellt.

➧ Erfolgt innerhalb zwei Minuten keine Eingabe, wird der Einstellbetrieb automatisch verlassen.

Activate basic menu without previous language selection.



```
                SIDATA
KEY        FUNCTION                              MENU
     1      CONTRAST
     2      BELL

PLEASE ENTER KEY OF THE REQUIRED FUNCTION
PRESS THE KEY

   SIDATA    TO LEAVE SIDATA MODE
LINE                                             KEYB
```

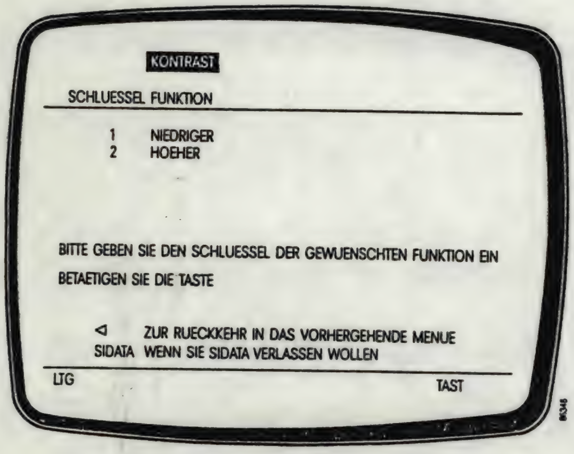
☐ With the keys SHIFT + SIDATA P1...P20 SIDATA select basic menu.

☐ Select the function desired with the corresponding numeric key 1 or 2 .

The function specified will be displayed in inverse video form.

➧ If no entry is made for a period of two minutes, the setting mode will be canceled automatically.

Menü KONTRAST

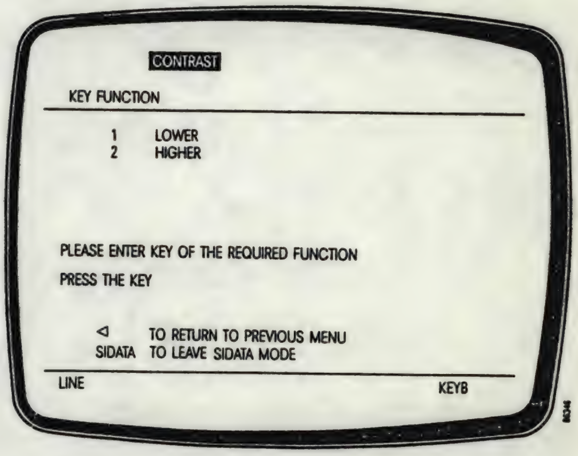


```
            KONTRAST
SCHLUESSEL FUNKTION
     1      NIEDRIGER
     2      HOEHER

BITTE GEBEN SIE DEN SCHLUESSEL DER GEWUENSCHTEN FUNKTION EIN
BETAETIGEN SIE DIE TASTE

     ◁      ZUR RUECKKEHR IN DAS VORHERGEHENDE MENUE
   SIDATA   WENN SIE SIDATA VERLASSEN WOLLEN
LTG                                              TAST
```

1 Mit dieser Taste wählen Sie das Menü KONTRAST.

Der Kontrast läßt sich in max. 16 Helligkeitsstufen auf den gewünschten Wert einstellen, dabei können Sie die Kontrastveränderung unmittelbar auf dem Bildschirm verfolgen: Das Wort KONTRAST verändert sich entsprechend der Einstellung.

CONTRAST menu

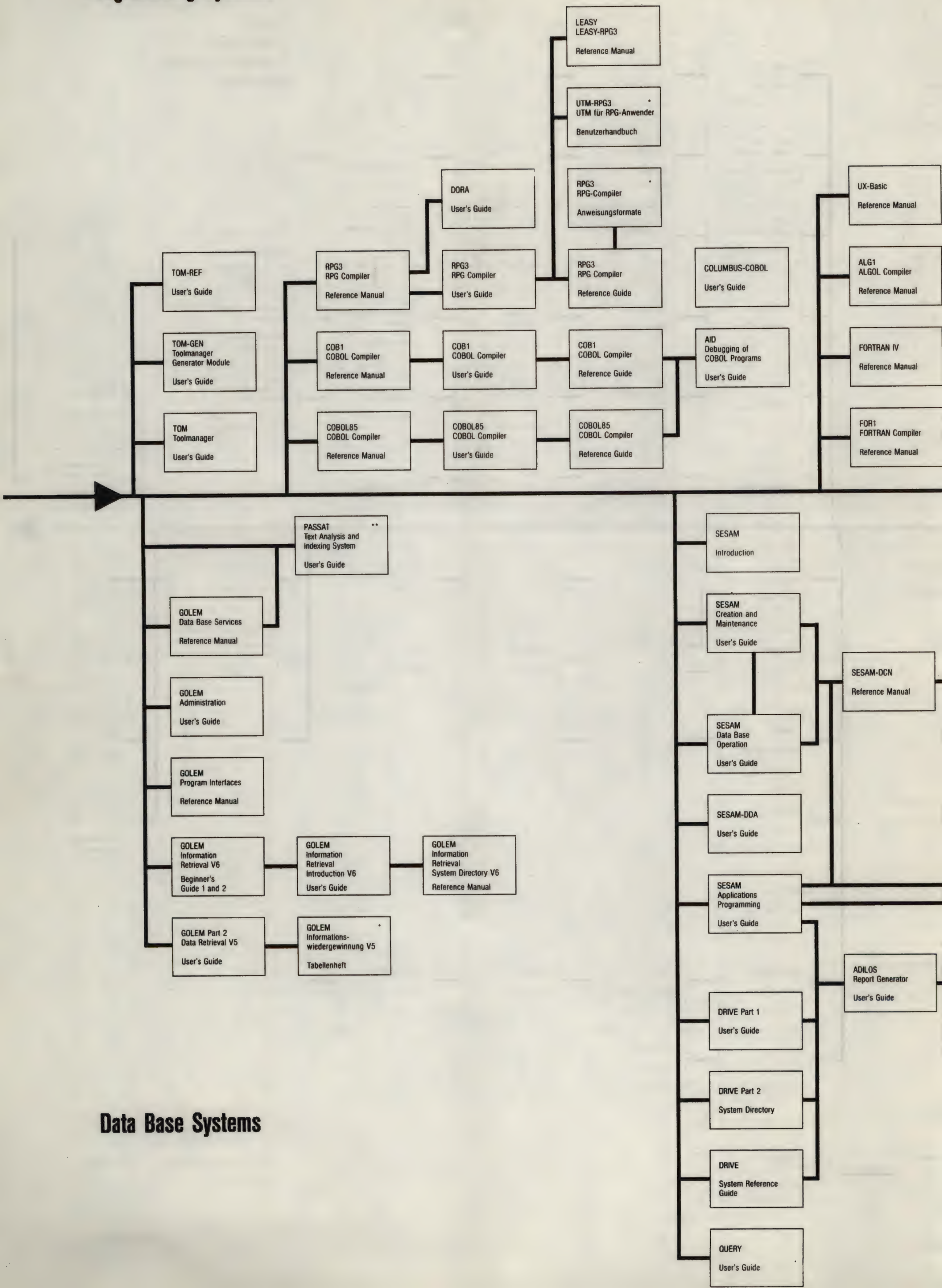


```
            CONTRAST
KEY FUNCTION
     1      LOWER
     2      HIGHER

PLEASE ENTER KEY OF THE REQUIRED FUNCTION
PRESS THE KEY

     ◁      TO RETURN TO PREVIOUS MENU
   SIDATA   TO LEAVE SIDATA MODE
LINE                                             KEYB
```

1 Select the CONTRAST menu using this key.

The screen contrast can be adjusted by selecting any of up to 16 levels of brightness, whilst you monitor how the contrast alters directly on the screen: The word CONTRAST is altered in accordance with the setting selected.

Programming Systems

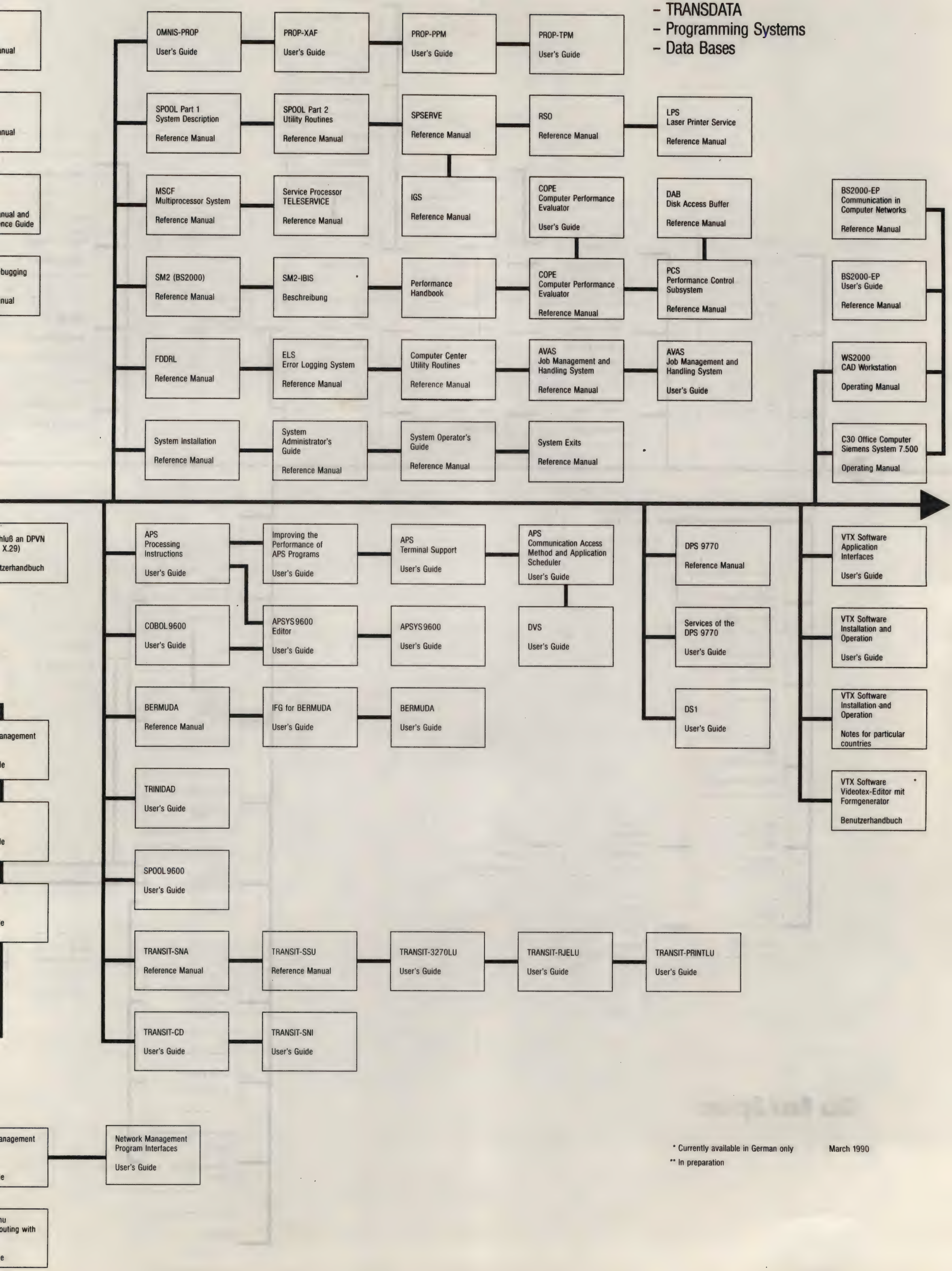

TOM-REF User's Guide
TOM-GEN Toolmanager Generator Module User's Guide
TOM Toolmanager User's Guide
RPG3 RPG Compiler Reference Manual
COB1 COBOL Compiler Reference Manual
COBOL85 COBOL Compiler Reference Manual
DORA User's Guide
RPG3 RPG Compiler User's Guide
COB1 COBOL Compiler User's Guide
COBOL85 COBOL Compiler User's Guide
LEASY LEASY-RPG3 Reference Manual
UTM-RPG3 * UTM für RPG-Anwender Benutzerhandbuch
RPG3 * RPG-Compiler Anweisungsformate
RPG3 RPG Compiler Reference Guide
COB1 COBOL Compiler Reference Guide
COBOL85 COBOL Compiler Reference Guide
COLUMBUS-COBOL User's Guide
AID Debugging of COBOL Programs User's Guide
UX-Basic Reference Manual
ALG1 ALGOL Compiler Reference Manual
FORTRAN IV Reference Manual
FOR1 FORTRAN Compiler Reference Manual
PASSAT ** Text Analysis and Indexing System User's Guide
GOLEM Data Base Services Reference Manual
GOLEM Administration User's Guide
GOLEM Program Interfaces Reference Manual
GOLEM Information Retrieval V6 Beginner's Guide 1 and 2
GOLEM Information Retrieval Introduction V6 User's Guide
GOLEM Information Retrieval System Directory V6 Reference Manual
GOLEM Part 2 Data Retrieval V5 User's Guide
GOLEM * Informations-wiedergewinnung V5 Tabellenheft
SESAM Introduction
SESAM Creation and Maintenance User's Guide
SESAM Data Base Operation User's Guide
SESAM-DDA User's Guide
SESAM Applications Programming User's Guide
DRIVE Part 1 User's Guide
DRIVE Part 2 System Directory
DRIVE System Reference Guide
QUERY User's Guide
SESAM-DCN Reference Manual
ADILOS Report Generator User's Guide

Data Base Systems

0

Publications Plan for

- BS2000
- TRANSDATA
- Programming Systems
- Data Bases


anual
anual
anual and
ence Guide
bugging
anual
OMNIS-PROP User's Guide
PROP-XAF User's Guide
PROP-PPM User's Guide
PROP-TPM User's Guide
SPOOL Part 1 System Description Reference Manual
SPOOL Part 2 Utility Routines Reference Manual
SPSERVE Reference Manual
RSO Reference Manual
LPS Laser Printer Service Reference Manual
MSCF Multiprocessor System Reference Manual
Service Processor TELESERVICE Reference Manual
IGS Reference Manual
COPE Computer Performance Evaluator User's Guide
DAB Disk Access Buffer Reference Manual
BS2000-EP Communication in Computer Networks Reference Manual
SM2 (BS2000) Reference Manual
SM2-IBIS Beschreibung •
Performance Handbook
COPE Computer Performance Evaluator Reference Manual
PCS Performance Control Subsystem Reference Manual
BS2000-EP User's Guide Reference Manual
FDDRL Reference Manual
ELS Error Logging System Reference Manual
Computer Center Utility Routines Reference Manual
AVAS Job Management and Handling System Reference Manual
AVAS Job Management and Handling System User's Guide
WS2000 CAD Workstation Operating Manual
System Installation Reference Manual
System Administrator's Guide Reference Manual
System Operator's Guide Reference Manual
System Exits Reference Manual
C30 Office Computer Siemens System 7.500 Operating Manual
hluß an DPVN X.29)
tzerhandbuch
APS Processing Instructions User's Guide
Improving the Performance of APS Programs User's Guide
APS Terminal Support User's Guide
APS Communication Access Method and Application Scheduler User's Guide
DPS 9770 Reference Manual
VTX Software Application Interfaces User's Guide
COBOL 9600 User's Guide
APSYS 9600 Editor User's Guide
APSYS 9600 User's Guide
DVS User's Guide
Services of the DPS 9770 User's Guide
VTX Software Installation and Operation User's Guide
BERMUDA Reference Manual
IFG for BERMUDA User's Guide
BERMUDA User's Guide
DS1 User's Guide
VTX Software Installation and Operation Notes for particular countries
anagement
le
TRINIDAD User's Guide
VTX Software Videotex-Editor mit Formgenerator Benutzerhandbuch •
le
SPOOL 9600 User's Guide
e
TRANSIT-SNA Reference Manual
TRANSIT-SSU Reference Manual
TRANSIT-3270LU User's Guide
TRANSIT-RJELU User's Guide
TRANSIT-PRINTLU User's Guide
TRANSIT-CD User's Guide
TRANSIT-SNI User's Guide
anagement
e
Network Management Program Interfaces User's Guide
nu
outing with
e

* Currently available in German only

** In preparation

March 1990

Contents

1 **Data Exchange with Data Display Terminals** **1-1**
1.1 Message Prefix 1-1
1.1.1 Operation with Message Header for Data Output to a Data Display Terminal 1-1
1.1.2 Operation with Message Header for Data Input from a Data Display Terminal 1-2
Structure of Parameter Area PAR 00E 1-3
Structure of Parameter Area PAR 01E 1-5
Parameter Area PAR 02E 1-5
Parameter Area PAR 03E 1-5
Error Messages 1-6
1.2 Message Section 1-7
1.2.1 Message Section with Parameter Entries (PAG) 1-7
Coding for Parameter Areas and Parameter Segments 1-8
1.2.1.1 Structure of Parameter Area PAR 00L 1-9
Send Data in Formatted Mode 1-15
Handling the MOD and BLI Bits 1-16
1.2.1.2 Description of Parameter Area PAR 01L 1-17
1.2.1.3 Description of Parameter Area PAR 00D 1-22
1.2.2 Message Section with Structured Commands 1-25
1.2.2.1 Read SIDATA Parameters (LSID) 1-25
Structure of Read Call 1-25
Sending and Receiving SIDATA Parameters 1-25
1.2.2.2 Read P-Areas (LPBE) 1-26
Structure of Read Call 1-26
Sending and Receiving P-Areas 1-26
1.2.2.3 Load Character Generator (LZEG) 1-27
Structure of "Load Character Generator" Command (LZEG) 1-27
1.2.2.4 Define Screen (DEBS) 1-30
1.2.2.5 Reset Screen (RDSS) 1-31
1.2.2.6 Write Display Area (SRBR) 1-31
1.2.2.7 Error Message for Structured Commands 1-32
1.2.3 Message Section with Positioning Commands (IS4 Sequence) 1-34
Coding of Line Address 1-34
Coding of Column Address 1-35
1.2.4 Message Section with Field Separators (IS2, IS3 Sequences) 1-36
Field Handling Characters (IS2 Sequence) 1-36
Coding of Field Handling Characters 1-37
Display Control Characters (IS3 Sequence) 1-38
Display Characteristics for Color Terminals 1-39
Coding of Display Control Characters 1-39
1.2.5 Message Section with Field and Character Attributes 1-40
1.2.5.1 Field Attribute (FAT) 1-40
Field Attribute 1 1-40
Field Attribute 2 1-41
Field Attribute 3 1-41
Field Attribute 4 1-41
1.2.5.2 Create Field Attributes (EZFA) 1-43
1.2.5.3 Modify Field Attributes (MOFA) 1-44

1.2.5.4 Character Attributes 1-45
Reset Character Attribute (RSZA) 1-45
Define Display Attribute (DEAA) 1-45
Define Color Attributes (DEFA) 1-46
Representation of Colors 1-47
Define Font (DEZS) 1-49
1.2.6 Message Section with Device Functions (ESC Sequences) 1-50
Coding of the Device Functions 1-50
1.2.7 Description of Device Functions 1-52
Cursor Positioning Functions 1-52
Text Manipulation Functions 1-54
Erase Functions 1-58
Data Transmission Functions 1-60
Functions for Data Exchange between DDT and Centrally Connected Printer 1-61
Programmable Key Functions 1-62
Special Functions 1-63
1.2.8 Operation with Status Messages 1-66
1.2.8.1 Query 1-66
1.2.8.2 Query Reply 1-67
Structure of Configuration Query Reply 1-67
Structure of Monitor Query Reply 1-71
Structure of Program Version Query Reply 1-74
Structure of Display Area Query Reply 1-76
1.2.9 Chip Card Terminal (CKT) Connection 1-77
1.2.9.1 Data Transmission from CPU to CKT 1-77
1.2.9.2 Data Transmission from CKT to CPU 1-79

2 Printer Operation 2-1
2.1 Message Structure 2-1
2.1.1 Unsolicited Print Output 2-1
2.1.1.1 Print Output to a Locally Connected Printer (Bypass Mode) 2-1
2.1.1.2 Print Output to a Centrally Connected Printer 2-2
2.1.2 Hardcopy Mode (Manual) 2-3
2.1.2.1 Print Output to a Locally Connected Printer 2-3
2.1.2.2 Print Output to a Centrally Connected Printer 2-4
2.1.2.3 Print Output to another Locally Connected Printer 2-5
2.1.3 Hardcopy Mode (Programmed) 2-6
2.1.3.1 Print Output to a Locally Connected Printer 2-6
2.1.3.2 Print Output to a Centrally Connected Printer 2-7
2.1.3.3 Print Output to another Locally Connected Printer 2-9
2.2 Acknowledgments 2-11
2.2.1 Acknowledgments from a DDT with Locally Connected Printer 2-11
Positive Acknowledgment 2-11
Negative Acknowledgment 2-11
2.2.2 Acknowledgments from a Centrally Connected Printer 2-12
Power Failure Acknowledgment 2-12
Positive Acknowledgment 2-12
Negative Acknowledgment 2-13

A **Appendix** **A-1**
A.1 Table of Functions for Data Display Terminals A-1
A.2 Code Tables A-2
A.2.1 EBCDI Code (International Version) A-2
A.2.2 EBCDI Code (German Version) A-3
A.2.3 ISO 7-Bit Code (International Version) A-4
A.2.4 ISO 7-Bit Code (German Version) A-5
A.2.5 Meaning of Control Characters in Code Tables A-6
A.3 Conversion Tables A-7
A.3.1 EBCDIC → ISO 7-Bit Code A-7
A.3.2 ISO 7-Bit Code → EBCDIC A-8

Abbreviations
References
Index

1 Data Exchange with Data Display Terminals

1.1 Message Prefix

1.1.1 Operation with Message Header for Data Output to a Data Display Terminal

Note

> The use of message headers is not permitted for new applications.
>
> Control of the functions is effected by means of parameter entries (PAG) (see section 1.2.1).

In the case of data output to a data display terminal (CPU = = > DDT), the message prefix must comprise at least the start-of-message character (NBZ).
The start-of-message character specifies the length of the following message header.

If the NBZ = X'40', then no message header follows the NBZ.
The length of parameter entries (PAG) is not specified in the NBZ.

Traffic direction	NBZ	Meaning
CPU ⟶ DDT	X'40'	No message header
	X'48'	Message header comprises PARAM0
	X'50'	Message header comprises PARAM0 + PARAM1
	X'58'	Message header comprises PARAM0 + PARAM1 + PARAM2

Table 1-1 Message prefix for data output

1.1.2 Operation with Message Header for Data Input from a Data Display Terminal

In the case of data input from a data display terminal (DDT = = > CPU), the message prefix must comprise at least the start-of-message character and an 8-byte message header (=PAR 00E).
If a text identifier is included, it follows the message header. The message header may also be longer than 8 bytes.

Traffic direction	NBZ	Meaning
DDT ⟶ CPU	X'48'	Message header comprises PAR 00E
	X'50'	Message header comprises PAR 00E + PAR 01E
	X'58'	Message header comprises PAR 00E + PAR 01E + PAR 02E
	X'60'	Message header comprises PAR 00E + PAR 01E + PAR 02E + PAR 03E
	X'58'	Message header comprises PAR 00E + PAR 01E + PAR 03E

Table 1-2 Message prefix for data input

Structure of Parameter Area PAR 00E

Cha-rac-ter	Short name	Meaning	Coding	Explanation
1	SAW	Send command	Depends on SAW1 or SAW2 used	Depending on the key used (DÜ1, DÜ2 or Fn), the corresponding send command SAW1 or SAW2 is entered in PAR 00E and executed. The function SAW1 is defined in PAR 00L, the function SAW2 in PAR 01L, by means of a CPU output. When the DDT is powered on or when the user has initiated the function 'LSP', SAW=X'00'.
2	PFLNG	Buffer length	X'40'	Not permitted for new application
3	ZLNG	Line length	X'30'	Not permitted for new application
4	AUSG	Revision level of program etc.	X'20'	DDT responds to status query
			X'3X'	X'30' thru X'33' used for 8161 DDT
			X'6X'	Reserved for 9750 and 8160 DDTs
			X'7X'	Entries for program function scope
			X'70'	9755 DDT - DIALOG
			X'71'	9755 DDT - BERMUDA
			X'72'	9756H DDT - DIALOG
			X'73'	9756H DDT - BERMUDA
			X'74'	9758M DDT - DIALOG
			X'75'	Reserved for 9758M DDT
			X'76'	9756H DDT - DIALOG (extended keyboard variants)
			X'77'	9756H DDT - BERMUDA (extended key validation)
			X'7F'	9756H DDT - libraries
5	ZZ1	Status character 1 Any keylock switches switched on are entered in ZZ1. ZZ1 is used as an extension of ZZ2.	Bit 7 6 5 4 3 2 1 1 Bit 1	=0: ID card not inserted 1) =1: ID card inserted
			Bit 2	=0: =1: Keylock switch 1 2)
			Bit 3	=0: =1: Keylock switch 2 2)
			Bit 4	=0: =1: Keylock switch 3 2)
			Bit 5	=0: =1: Local device on ANS6 3)
			Bit 6	=0: =1: Local device on ANS7 3)

Character	Short name	Meaning	Coding	Explanation
6	ZZ2	Status character 2 The operable local devices are entered in ZZ2.	Bit 7 6 5 4 3 2 1 1	
			Bit 1	=0: =1: Keyboard 3)
			Bit 2	=0: =1: Local device with dev addr 1 3)
			Bit 3	=0: =1: Local device with dev addr 2 3)
			Bit 4	=0: =1: Local device with dev addr 3 3)
			Bit 5	=0: =1: Local device with dev addr 4 3)
			Bit 6	=0: =1: Local device with dev addr 5 3)
7	CDS	Code for send keys The code for the activated send key is entered in this character.	See Table 1-46 "Data transmission functions"	Execution in accordance with Table 1-46 "Data transmission functions".
8	WAR	Queue identifier	Any, but no transmission control characters	The DDT returns unchanged the WAR defined by the CPU.

1) ID card removal also notified to CPU by means of short message K14.

2) 0: Keylock switch 'OFF'
   1: Keylock switch 'ON'

3) 0: Device inoperable, i.e.
   - not connected or
   - faulty (device-related status message)

   1: Device operable

Table 1-3 Description of characters in PAR 00E

Structure of Parameter Area PAR 01E

Character	Short name	Meaning	Coding	Explanation
1	TIL	Text identifier length	X'40'	No text identifier TI
			X'41'	TI comprises 8 bytes (PAR 01D)
			X'42'	TI comprises 16 bytes (PAR 01D + PAR 02D)
			X'43'	TI comprises 24 bytes (PAR 01D + PAR 02D + PAR 03D)
2	TKL	Text header length	X'00'	Reserved
3	ZLA	Line address	Coding depends on FST3 of PAR 00L (bit 2)	Characters 3, 4 and 5 specify the position of the cursor prior to pressing a DÜ, K or F key.
4	SPA1	Column address	Coding as per Table 1-25	
5	SPA2	Column address		
6	FEM	Error message	See Table 1-5 for error messages.	
7	—	—	X'00'	Reserved
8	ZZ5	—	X'40'	No PAR 03E
			X'42'	PAR 03E contains the terminal identifier. This is taken from PAR 13D.

Table 1-4 Description of characters in PAR 01E

Parameter Area PAR 02E

Parameter area **PAR 02E** is reserved for field mode. (in field mode; character 6 (FST4) of PAR 00L=X'42')

Parameter Area PAR 03E

For terminal identification purposes, parameter area **PAR 13D** is sent to the CPU.

Error Messages

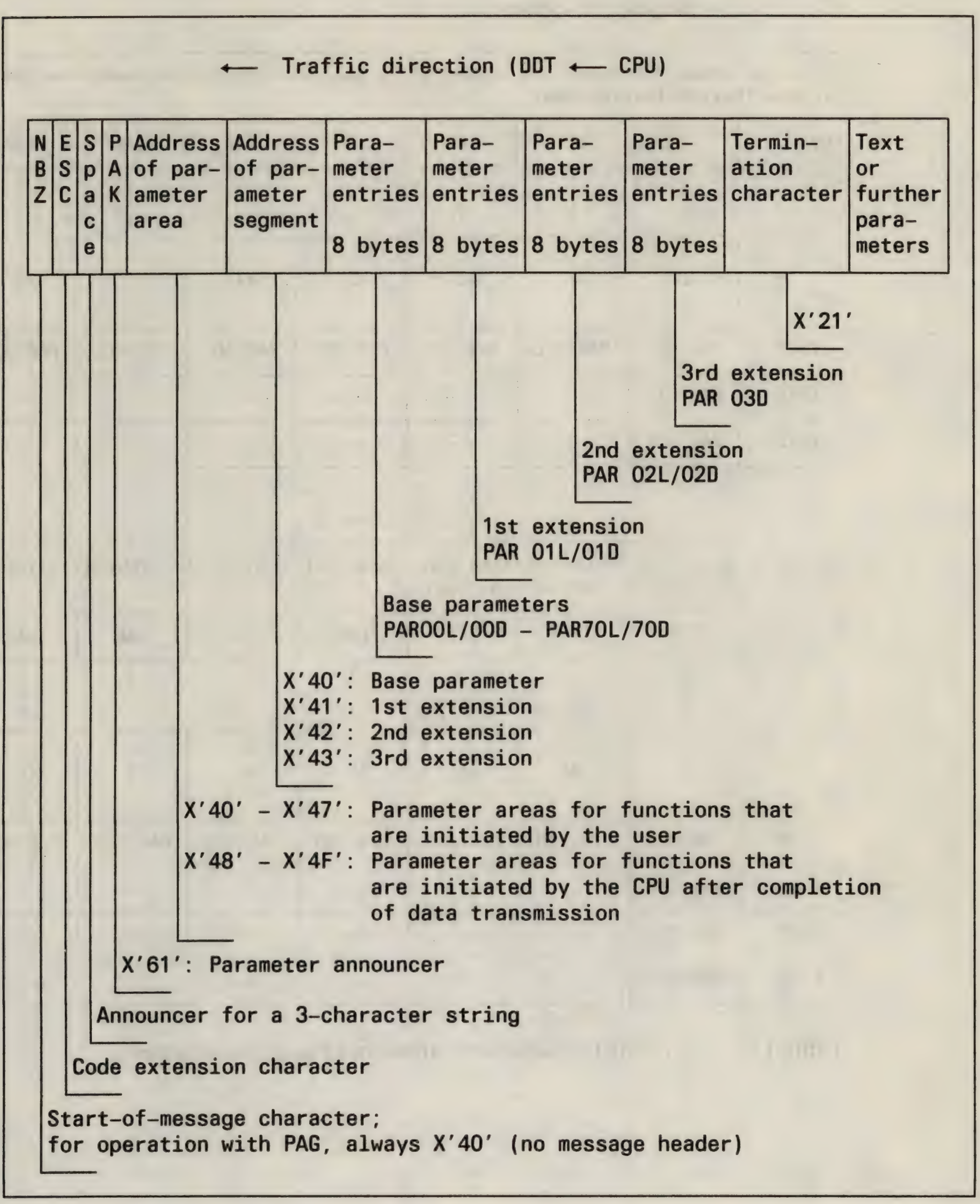
Coding	Function	Remark
X'40'	MAR	Field cannot be marked
X'41'	WDH	Invalid address
X'42'	WDH	Start after LZE with character ≠ NUL
X'44'	LVA	Invalid address
X'46'	PAR	Area full 1)
X'47'	PAR	Illegal characters 1)
X'48'	PAR	Illegal function 1)
X'4A'	P	P-area full
X'4B'	P	Illegal character
X'4C'	P	Illegal function
X'4F'	PAR OOD	Printer control characters (ESC sequence) in PAR OOD
X'51'	-	Invalid ESC sequence
X'52'	PAK	Parameter entries invalid or incorrect
X'53'	FTZ	IS2/IS3 sequence invalid at this position
X'54'	position	Invalid positioning entries
X'55'	DÜ	Illegal function in message
X'56'	PAR OOD	Illegal function in PAR OOD
X'57'	LA	Illegal function in message
X'58'	PAR01E-FEM	Configuration or parameter error in command
X'5A'	SS	Illegal function in PAR OOD
X'60'	data output	Characters after LZE
X'61'	EFG	Insertion of character in protected field
X'62'	AFG	Erase in protected field or following LZE
X'63'	LZF	Invalid in protected field
X'64'	LVD	Invalid in protected field
X'65'	EFG	Insertion of alphanumeric character in a numeric field
X'7F'	RM	Acknowledgment buffer overflow

1) Not applicable to 9755 DDT and up

Table 1-5 Error messages

1.2 Message Section

1.2.1 Message Section with Parameter Entries (PAG)



← Traffic direction (DDT ← CPU)

NBZ	ESC	Space	PAK	Address of parameter area	Address of parameter segment	Parameter entries 8 bytes	Parameter entries 8 bytes	Parameter entries 8 bytes	Parameter entries 8 bytes	Termination character	Text or further parameters

X'21'

3rd extension
PAR 03D

2nd extension
PAR 02L/02D

1st extension
PAR 01L/01D

Base parameters
PAR00L/00D - PAR70L/70D

X'40': Base parameter
X'41': 1st extension
X'42': 2nd extension
X'43': 3rd extension

X'40' - X'47': Parameter areas for functions that are initiated by the user
X'48' - X'4F': Parameter areas for functions that are initiated by the CPU after completion of data transmission

X'61': Parameter announcer

Announcer for a 3-character string

Code extension character

Start-of-message character;
for operation with PAG, always X'40' (no message header)

Table 1-6 Structure of a message section with parameter entries

Coding for Parameter Areas and Parameter Segments

Meaning of abbreviations used in the table:

PA = parameter area
PS = parameter segment

Parameter areas for functions initiated by the data display terminal user by means of keys (hexadecimal coding):

Key		LA1	LA2	LA3	LA4	LA5	LA6	LA7
	↓	↓	↓	↓	↓	↓	↓	↓
PA PS	40	41	42	43	44	45	46	47
X'40'	PAR 00L	PAR 10L	PAR 20L	PAR 30L	PAR 40L	PAR 50L	PAR 60L	PAR 70L
X'41'	PAR 01L	—	—	—	—	—	—	—
X'42'	PAR 02L	—	—	—	—	—	—	—

Parameter areas for CPU-controlled functions initiated by the CPU only after completion of data transmission (hexadecimal coding):

Function	GEF	LA1	LA2	LA3	LA4	LA5	LA6	LA7
	↓	↓	↓	↓	↓	↓	↓	↓
PA PS	48	49	4A	4B	4C	4D	4E	4F
X'40'	PAR 00D	PAR 10D	PAR 20D	PAR 30D	PAR 40D	PAR 50D	PAR 60D	PAR 70D
X'41'	PAR 01D	—	—	—	—	—	—	—
X'42'	PAR 02D	—	—	—	—	—	—	—
X'43'	PAR 03D	—	—	—	—	—	—	—

Table 1-7 Coding for parameter areas and parameter segments

1.2.1.1 Structure of Parameter Area PAR 00L

Character	Short name	Meaning	Coding	Explanation
1	SAW1	Send command 1	See "Send data in formatted mode"	The character SAW1 is evaluated on activation of DÜ1 or F functions. On data input, the code for the send command used is taken over into PAR 00E. Invalid codes are dealt with as "Send unprotected fields".
			X'40'	- Send unprotected fields - from start of memory to EM or end of memory. - Transmit with NUL - FHC, bit 1=0: Transmit field contents
			X'41'	- Send modified fields - from start of memory to EM or end of memory. - Transmit with NUL - FHC, bit 1=0, bit 3=1 and bit 6=1: Transmit field addresses and field contents - FHC, bit 1=1, bit 3=1 and bit 6=1: Transmit field addresses
			X'42'	- Send unprotected fields - from cursor to EM or end of memory. - Transmit with NUL - FHC, bit 1=0: Transmit cursor addresses and field contents
			X'43'	Send display memory including all field separators
			X'44'	- Send unprotected fields - from start of memory to EM or end of memory. - Transmit without NUL - FHC, bit 1=0: Transmit field addresses and field contents
			X'45'	- Send modified fields - from start of memory to EM or end of memory. - Transmit without NUL - FHC, bit 1=0, bit 3=1 and bit 6=1: Transmit field addresses and field contents - FHC, bit 1=1, bit 3=1 and bit 6=1: Transmit field addresses

Character	Short name	Meaning	Coding	Explanation
			X'46'	- Send unprotected fields - from cursor to EM or end of memory. - Transmit without NUL - FHC, bit 1=0: Transmit cursor addresses, field addresses and field contents
			X'47'	Send current field
			X'48'	- Send unprotected fields - from AM or start of screen to cursor - Transmit with relevant NULs - FHC, bit 1=0: Transmit AM or start of screen addresses, AM, field addresses and field contents
			X'49'	Reserved
			X'4A'	Reserved
			X'4B'	Reserved
			X'4C'	- Send unprotected fields - from start of memory to EM or end of memory. - Transmit with relevant NULs - FHC, bit 1=0: Transmit field addresses and field contents
			X'4D'	- Send modified fields - from start of memory to EM or end of memory. - Transmit with relevant NULs - FHC, bit 1=0, bit 3=1 and bit 6=1: Transmit field addresses and field contents - FHC, bit 1=1, bit 3=1 and bit 6=1: Transmit field addresses
			X'4E'	- Send unprotected fields - from cursor to EM or end of memory. - Transmit with relevant NULs - FHC, bit 1=0: Transmit cursor addresses, field addresses and field contents
			X'4F'	- Send modified fields - from start of memory to EM or end of memory. - Transmit without NUL - FHC, bit 3=1: Transmit field addresses and field contents

Character	Short name	Meaning	Coding	Explanation
2	FST1	Function control character 1	Bit 7 6 5 4 3 2 1 1 Bit 1	Input of functions EFZ and AFZ 1) =0: permitted via keyboard =1: prohibited via keyboard
			Bit 2	For EFZ: =0: Field separators and protected data are copied from the last line into the cursor line; unprotected data is replaced by NUL. =1: FTZ and all data are copied from the last line into the cursor line.
			Bit 3	For AFZ: =0: FTZ and protected data from the cursor line are copied into the last line; unprotected data is replaced by NUL. =1: FTZ and all data are copied from the cursor line into the last line.
			Bit 4	=0: FST2, bit 3=0: Cursor can also be positioned to characters in protected fields FST2, bit 3=1: Cursor skips protected, unmarked fields =1: Cursor function: Protected fields can be accessed by cursor. 2)
			Bit 5	=0: Function "RU" permitted =1: Function "RU" prohibited
			Bit 6	=0: Roll-up mode (RUB) deactivated =1: Roll-up mode (RUB) activated

1) In unformatted mode the functions EFZ, AFZ, RU and RUB can be used without restriction; in formatted mode each line must begin with an FHC.

2) When FST2 bit 3 = 0, the cursor can also be positioned to characters in protected fields by using the cursor keys.
When FST2 bit 3 = 1, the cursor skips protected, non-markable fields.

Cha-rac-ter	Short name	Meaning	Coding	Explanation
3	FST2	Function control character 2	Bit 7 6 5 4 3 2 1 1 Bit 1	"Erase memory" function (LSP): =0: Activation allowed via keyboard =1: Activation prohibited via keyb.
			Bit 2	=0: Parameter areas PAR 10L - PAR 70L are not deleted when the 'LSP' function is initiated. =1: Parameter areas PAR 10L - PAR 70L are deleted when the 'LSP' function is initiated.
			Bit 3	=0: Automatic tabulation: (ATAB) deactivated. 1) =1: Automatic tabulation: (ATAB) activated. 2)
			Bit 4	=0: After completion of a data transfer from CPU to DDT, the MOD bits in all FHCs and the BLI bits in the DCCs of the markable fields are deleted, even if these FTZs originate from a different message. Neither bit is changed if only parameters, or a print message in bypass mode, were transmitted.
			Bit 5	See Table 1-10
			Bit 6	=0: Characters in unprotected fields from the cursor position to the EM or end of screen are deleted. If the field containing the cursor begins with FHC and DCC and is also markable, the BLI bit is deleted in the DCC and the MOD bit is deleted in the FHC. In all fields, from cursor to EM or end of screen, the MOD bit is deleted if these fields are unprotected. If these fields begin with DCC and FHC, the BLI bits in the DCCs will also be deleted. =1: Characters in unprotected fields from start of screen to end of screen are deleted. In all unprotected fields the MOD bits are deleted in the FHCs. In all unprotected fields, with DCC and FHC, the BLI bits are also deleted in these DCCs.

1) After input of a character, the cursor is automatically positioned to the next write position. In protected fields, no input is possible. The cursor must be positioned to an unprotected field by means of the cursor control keys. Protected, markable fields can be marked, for example, by means of the "Mark" key.

2) After input of a character, the cursor is automatically positioned to the next write position. When the last character has been entered in an unprotected field, the cursor jumps to the start of the next unprotected or protected, markable field.

Cha-racter	Short name	Meaning	Coding	Explanation
4	GEF1	Device function character 1		As part of a PAG, GEF1 has no meaning in PAR00L. All device functions initiated by the CPU are then controlled by entries in PAR00D.
5	FST3	Function control character 3	Bit 7 6 5 4 3 2 1 ↓ 1	
			Bit 1	=0: Cursor position: After a data transfer, cursor is positioned after last character received. 1) =1: Cursor position: After a data transfer, cursor remains in same position. 2)
			Bit 2	=0: Prohibited for new application. =1: For DATA INPUT, the start-of-field address and the cursor position are specified in PAR 01E, in accordance with the coding (Table 1-24).
			Bit 3	=0: For data input, the message header should comprise only PAR 00E. =1: For data input, the message header should comprise only PAR 00E + PAR 01E.
			Bit 4	=0: After the data input the cursor is positioned after the effective end marker or start of screen. =1: The cursor position is not affected by data input.
			Bit 5	=0: Interactive mode off. Any number of data transfers to the CPU can be initiated without any messages expected from the CPU. =1: Interactive mode on; the keyboard is locked after a transmission function is initiated. A CPU output that affects the display memory resets the keyboard lock. Short messages to the CPU are always possible.
			Bit 6	=0: Keyboard is released =1: Keyboard is locked Short messages (Kx) to the CPU are always possible.

1) After a data transfer from the CPU to the DDT the cursor is positioned
   - after the last character received,
   - at the position reached by the last positioning operation,
   - when the SS function is used, at the position stored by the SS function.
2) After a data transfer from the CPU to the DDT the cursor is positioned
   - when the SS function is used, at the position stored by the SS function,
   - at the same position as at the start of the data transfer if the message does not contain an SS function or if PAR 00D does not contain any relative positioning, i.e. the operator can continue to work normally unless his text (e.g. in lines 1...23) is overwritten by this message (e.g. in line 24).

Character	Short name	Meaning	Coding	Explanation
6	FST4	Function control character 4	Bit 7 6 5 4 3 2 1 1	
			Bit 1	Insignificant
			Bit 2	=0: Block mode, parameter area PAR 02E not transferred =1: BERMUDA mode, parameter area PAR 02E transferred.
			Bit 3	Insignificant
			Bit 4	
			Bit 5	
			Bit 6	=1: When the SBA key is pressed, the cursor jumps to start of screen, regardless of cursor function and ATAB
7	GEF2	Device function character 2	——	The character GEF2 in PAR00L is transferred to PAR 00D if received as part of the message header. As part of PAG it has no meaning.
8	WAR	Queue identifier	Any; no transmission control chars.	Transmitted unchanged to the CPU during data input.

Table 1-8 Description of characters in PAR 00L

Send Data in Formatted Mode

<table>
<tr><th colspan="3">SAW code 1)</th><th>48</th><th>40</th><th>44</th><th>4C</th><th>42</th><th>46</th><th>4E</th><th>41</th><th>45</th><th>4D</th><th>4F</th><th>43</th></tr>
<tr><td colspan="3" rowspan="4"></td><td colspan="7">Send unprotected fields</td><td colspan="4">Send modified fields</td><td>Send display memory</td></tr>
<tr><td>from AM or screen top</td><td colspan="3">from start of memory</td><td colspan="3">from cursor</td><td colspan="4">from start of memory</td><td>from start</td></tr>
<tr><td>to cursor</td><td colspan="10">to end marker or end of memory</td><td>to end 3)</td></tr>
<tr><td>with relevant NUL</td><td>with NUL</td><td>no NUL</td><td>with rel. NUL</td><td>with NUL</td><td>no NUL</td><td>with rel. NUL</td><td>with NUL</td><td>no NUL</td><td>with rel. NUL</td><td>no NUL</td><td>with NUL</td></tr>
<tr><td colspan="3">Bit set in FHC</td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>1</td><td>6</td><td>3</td></tr>
<tr><td rowspan="4">0</td><td rowspan="2">0</td><td>0</td><td rowspan="4">AM address or start-of-screen address + AM + field addresses + field contents 2)</td><td rowspan="4">Field contents</td><td colspan="2" rowspan="4">Field addresses + field contents</td><td rowspan="4">Cursor addr. + field contents</td><td colspan="2" rowspan="4">Cursor address + field addresses + field contents</td><td>—</td><td>—</td><td>—</td><td>—</td><td rowspan="8">Text + field separators</td></tr>
<tr><td>1</td><td colspan="3" rowspan="3">Field addresses + field contents</td><td>Field addrs. + field conts.</td></tr>
<tr><td rowspan="2">1</td><td>0</td><td>—</td></tr>
<tr><td>1</td><td>Field addrs. + field conts.</td></tr>
<tr><td rowspan="4">1</td><td rowspan="2">0</td><td>0</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>1</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td colspan="3" rowspan="3">Field addresses</td><td>Field addrs. + field conts.</td></tr>
<tr><td rowspan="2">1</td><td>0</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>1</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>Field addrs. + field conts.</td></tr>
</table>

1) Hexadecimal coding
2) An end marker is treated as a data character.
3) Unrestricted

Table 1-9 Send data in formatted mode

Explanation

- EM:
  Only EMs in fields to be transmitted are interpreted.
- Relevant NUL:
  NULs are relevant NULs when they identify an offset, i.e. followed in the same field by at least one character to be transmitted or EM.
- LZE:
  Characters following an LZE up to end of field or end of line are not transmitted.

Handling the MOD and BLI Bits

When the 'LZF' function is entered, the MOD and BLI bits - depending on character 3 of PAR 00L (FST2) - are set, reset or remain unchanged.

Meaning of abbreviations used in the table:

M = MOD bit,
B = BLI bit (flashing bit)
↑ = set,
↓ = reset,
– = unchanged

Handling of the MOD and BLI bits		FST2			
		Bit 5 = 0		Bit 5 = 1	
from	to	M	B	M	B
start of field	end of field	↓	↓	↑	—
start of field	any position in field	↓	↓	↑	—
any position in field	any position in field	—	—	↑	—
any position in field	end of field	—	—	↑	—

Table 1-10 Handling of the MOD and BLI bits

1.2.1.2 Description of Parameter Area PAR 01L

The parameter area PAR 01L is used as an extension of the base parameter area PAR 00L and can only be loaded by means of parameter entries (PAG).

Character	Short name	Meaning	Coding	Explanation
1	TIL	Text identifier length	X'40'	No text identifier (TI) requested
		Specifies if and in what length a TI is to be transferred from the mailbox (= PAR 01D, PAR 02D and PAR 03D) during the next data input.	X'41'	TI comprises 8 bytes (PAR 01D)
			X'42'	TI comprises 16 bytes (PAR 01D + PAR 02D)
			X'43'	TI comprises 24 bytes (PAR 01D + PAR 02D + PAR
2	TKL	Text header length	X'40'	Insignificant
3	FST5	Function control character 5 Usage lock for LA keys in the case of activation by the user and within P functions	Bit 7 6 5 4 3 2 1 1	
			Bit 1	0: Key LA1 1) 1:
			Bit 2	0: Key LA2 1) 1:
			Bit 3	0: Key LA3 1) 1:
			Bit 4	0: Key LA4 1) 1:
			Bit 5	0: Key LA5 1) 1:
			Bit 6	0: Keys LA6 and LA7 1) 1:

1) 0: The terminal user pressing the key initiates a print operation.
1: Pressing the key does not initiate a print operation. The LA function is locked for the terminal user.

Character	Short name	Meaning	Coding	Explanation
4	FST6	Function control character 6 Usage lock for P keys in case of activation by the user	Bit 7 6 5 4 3 2 1 ↓ 1	
			Bit 1	0: Key P1 2) 1:
			Bit 2	0: Key P2 2) 1:
			Bit 3	0: Key P3 2) 1:
			Bit 4	0: Key P4 2) 1:
			Bit 5	0: Key P5 2) 1:
			Bit 6	0: Keys P6 - P20 2) 1:
5	FST7	Function control character 7 Programming lock for P keys	Bit 7 6 5 4 3 2 1 ↓ 1	
			Bit 1	0: Key P1 3) 1:
			Bit 2	0: Key P2 3) 1:
			Bit 3	0: Key P3 3) 1:
			Bit 4	0: Key P4 3) 1:
			Bit 5	0: Key P5 3) 1:
			Bit 6	0: Keys P6 - P20 3) 1:

2) 0: The terminal user pressing the key initiates the character and/or function string stored in the Pn-area.

1: Pressing the key does not initiate any function. Use of the key is locked for the terminal user.

3) 0: The P-area can be written to ("loaded") by the terminal user. The user can enter any desired character and/or function string in this P-area to facilitate operation.

1: The terminal user is locked out from writing to the P-area (e.g. because it is reserved for the CPU).

Character	Short name	Meaning	Coding	Explanation
6	SAW2	Send command 2	See "Send data in formatted mode"	SAW2 is evaluated on activation of the DÜ2 function. SAW1 and SAW2 have the same functional scope. On data input, the code for the SAW is taken over into PAR00E. Only for DÜ2: Invalid codes are dealt with as "Send unprotected fields".
			X'40'	- Send unprotected fields - from start of memory to EM or end of memory. - Transmit with NUL - FHC, bit 1=0: Transmit field contents
			X'41'	- Send modified fields - from start of memory to EM or end of memory. - Transmit with NUL - FHC, bit 1=0, bit 3=1 and bit 6=1: Transmit field addresses and field contents - FHC, bit 1=1, bit 3=1 and bit 6=1: Transmit field addresses
			X'42'	- Send unprotected fields - from cursor to EM or end of memory. - Transmit with NUL - FHC, bit 1=0: Transmit cursor addresses and field contents
			X'43'	Send display memory including all field separators
			X'44'	- Send unprotected fields - from start of memory to EM or end of memory. - Transmit without NUL - FHC, bit 1=0: Transmit field addresses and field contents
			X'45'	- Send modified fields - from start of memory to EM or end of memory. - Transmit without NUL - FHC, bit 1=0, bit 3=1 and bit 6=1: Transmit field addresses and field contents - FHC, bit 1=1, bit 3=1 and bit 6=1: Transmit field addresses
			X'46'	- Send unprotected fields - from cursor to EM or end of memory. - Transmit without NUL - FHC, bit 1=0: Transmit cursor addresses, field addresses and field contents

Character	Short name	Meaning	Coding	Explanation
			X'47'	Send current field
			X'48'	- Send unprotected fields - from AM or start of screen to cursor - Transmit with relevant NULs - FHC, bit 1=0: Transmit AM or start of screen addresses, AM, field addresses and field contents
			X'49'	Reserved
			X'4A'	Reserved
			X'4B'	Reserved
			X'4C'	- Send unprotected fields - from start of memory to EM or end of memory. - Transmit with relevant NULs - FHC, bit 1=0: Transmit field addresses and field contents
			X'4D'	- Send modified fields - from start of memory to EM or end of memory. - Transmit with relevant NULs - FHC, bit 1=0, bit 3=1 and bit 6=1: Transmit field addresses and field contents - FHC, bit 1=1, bit 3=1 and bit 6=1: Transmit field addresses
			X'4E'	- Send unprotected fields - from cursor to EM or end of memory. - Transmit with relevant NULs - FHC, bit 1=0: Transmit cursor addresses, field addresses and field contents
			X'4F'	- Send modified fields - from start of memory to EM or end of memory. - Transmit without NUL - FHC, bit 3=1: Transmit field addresses and field contents

Character	Short name	Meaning	Coding	Explanation
7	FST8	Function control character 8	Bit 7 6 5 4 3 2 1 1	
			Bit 1	0: ID card input blocked =1: ID card input expected (keyboard input locked)
			Bit 2	=1: When the next message is sent to the CPU, the TID from PAR13D should also be transmitted.
			Bit 3	=0: If an error is detected in the message, then - the first error is entered in PAR01E-FEM - the errored function or command is ignored - evaluation of the message is continued - and, if requested, the error code is transmitted to the CPU on the next input in PAR01E-FEM. The FEM byte is reset before receipt of the next message. If more than one output occurs in immediate succession, it may happen that only the error in the last message will be transferred. If the last message is error-free, then on the next input to the CPU, X'00' is entered in PAR01E-FEM. =1: Errors from the functional scope of the 9756H DDT Level 1 produce no error messages. Errors in the parameter fields of the commands automatically result in an error message. If an error is detected in the parameter field of a command, then - the keyboard is locked (K keys are not locked) - processing of the message is aborted at this point - any function that may be entered in PAR00D (GEF1, GEF2) is deleted - an error message is sent to the CPU - an error message is displayed in the device indicator line. The keyboard remains locked until the next output with PAR00L-FST3-TAST=0 from the CPU.
			Bit 4	=0: The terminal user can also switch character attributes through the keyboard. =1: The terminal user cannot switch character attributes through the keyboard.
			Bit 5	Reserved
			Bit 6	Insignificant
8	—	—	—	Reserved

Table 1-11 Description of characters in PAR 01L

1.2.1.3 Description of Parameter Area PAR 00D

The parameter area `PAR 00D` is loaded through data output from the CPU. `PAR 00D` is reserved exclusively for device functions that are to be initiated only when a data output has been completed.

Loading of the parameter area can be effected by means of parameter entries (`PAG`) or through entries in `PARAM0` of a message header. If a message header is used, the entries for executing the device functions are transferred automatically from `PAR 00L` (`GEF1`) to `PAR 00D`.

Note

- If an LA function is to be initiated by the CPU, then the associated parameter area (`PAR 10D` – `PAR 70D`) for the initiated function must be loaded.
- The use of a message header is prohibited for new applications.

Character	Short name	Meaning	Coding	Explanation
1	GEF1	Device function character 1	According to the code tables for the device functions (Table 1-41 and Table 1-42) or announcer for a 3-character string: X'20' (Space).	The device function entered is activated on completion of the data output. This function is repeated on completion of each data transfer to the DDT until a message is received that also contains parameter entries or a new GEF1 is entered. GEF1=X'00' does not activate any device function. Execution of the device functions as for activation via the keyboard. If GEF1 is received as part of a parameter entry PAG, GEF1 has no meaning in PAROOL. All device functions initiated by the CPU are then controlled by entries in PAROOD. 1)
2	GEF2	Device function character 2	According to the 3rd character of a 3-character string (Table 1-42)	The device function entered is activated on completion of the data output. GEF2 is evaluated only if the announcer for a 3-character string is entered in GEF1. 1)
3	—	—	X'00'	Reserved
4	LAP1	LA function parameter	X'40'	The received message is transferred from the transmission buffer into the parameter areas or into the display area; the device functions specified in the code tables, and absolute positioning operations, are executed.
			X'41'	The received message is transferred from the transmission buffer into the parameter areas or into the display area; the device functions specified in the code tables, and absolute positioning operations and field separators, are executed. The part of the message following PAROOD is transferred unchanged to the print buffer and, if an LA function is entered in PAROOD, printed by the specified printer. The parameters specified in parameter areas PARXOD (X = 1 through 7) are used for device addressing and control of the printout.
5	AZP	Indicator line (bottom line)	X'40'	Display of device indicator line
			X'41'	Display of system line 2)
6	—	—	X'00'	Reserved
7	—	—	X'00'	Reserved
8	—	—	X'00'	Reserved

1) Entry of the code extension character ESC (X'1B') is not permitted in GEF1 and GEF2.

2) The system line is displayed in the bottom line. When inserting (EFG indicator), and in the case of local operating and device errors, the system line is replaced by the device indicator line. When insert mode has been reset or after the error indication has been canceled by the "Reset" key, the system line is displayed again.

Table 1-12 Description of characters in PAR 00D

1.2.2 Message Section with Structured Commands

1.2.2.1 Read SIDATA Parameters (LSID)

Implemented for the 9756, 9758, 9762 and 9763 DDTs.

Structure of Read Call

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	30	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	30		
3	30		
4	36		
5	32	PAFK	Parameter field ID for LSID
6	30		

Table 1-13 Message structure for reading SIDATA parameters (LSID)

Sending and Receiving SIDATA Parameters

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5 6	32 30	PAFK	Parameter field ID for LSID
n	xx . . .		Data Each two characters received in this block are combined to produce one character.

Table 1-14 Message structure for sending and receiving SIDATA parameters (LSID)

1.2.2.2 Read P-Areas (LPBE)

Implemented for the 9756, 9758, 9762 and 9763 DDTs.

Structure of Read Call

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	30	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	30		
3	30		
4	36		
5	32	PAFK	Parameter field ID for LPBE
6	31		

Table 1-15 Message structure for reading P-areas (LPBE)

Sending and Receiving P-Areas

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	32	PAFK	Parameter field ID for LPBE
6	31		
n	xx . . .		Data

Table 1-16 Message structure for sending and receiving P-areas (LPBE)

1.2.2.3 Load Character Generator (LZEG)

Implemented for the 9763 DDT.

Structure of "Load Character Generator" Command (LZEG)

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	30	PAFK	Parameter field ID for LZEG
6	38		
7	3x	FORM	X'30' = LZEG without continuation X'31' = LZEG with continuation FORM = X'30' Data segment starts at byte 25 if data segment is output. FORM = X'31' is required only if additional parameters are required, e.g. when loading the triple-plane ZEG for color monitors. The continuation starts at byte 25.
8	3x	MATL	X'30' = do not delete ZEG contents X'31' = delete ZEG contents In all character boxes of the font specified in byte 16, all the pixels are deleted before loading. In positive display mode on monochrome monitors, all the deleted pixels are light. In negative display mode on color monitors with a single-plane ZEG, all the deleted pixels are dark. With a triple-plane ZEG, the plane specified in byte 32 of the ZEG specified in byte 16 is deleted. If X'30' is specified in byte 32, all planes of the triple-plane specified in byte 16 are deleted. If the parameter segment is output without extension, all planes of the triple-plane ZEG specified in byte 16 are deleted. With a triple-plane ZEG, all the deleted pixels are dark.

Byte	Code(Hex)	Meaning	
9	30	(res.)	
10	30	(res.)	
11	3x	MODE	X'30' = without compression X'31' = with compression
12	3X	TYP	X'30' = assignment of a ZEG The symbolic name (LOGZEG) is assigned to the physical ZEG (PHYZEG) if the physical ZEG is not already reserved (e.g. for 97801 emulation). X'31' = handling of the assignment(s) in accordance with byte 13 The contents of the ZEGs (ZEG0 thru ZEG7) are not changed when an assignment is deleted. If the command also contains ZEG data, this is entered without assignment in the specified physical ZEG. The entry from byte 8 is not interpreted.
13	3X	PARAM	Parameter X'34' All ZEG assignments made by the CPU are deleted. ZEG assignments made by the DDT, e.g. for 97801 emulation, are retained. X'35' The assignment for the ZEG specified in byte 16 is deleted if the assignment was made by the CPU.
14	xx	STADR	Start address in font for characters in ISO 7-bit code. xx = high-order halfbyte and yy = low-order halfbyte The halfbytes (hex code) should each be converted into individual characters for transfer. Example where X'1E' is start address: 1st halfbyte C'1' in X'31' and 2nd halfbyte C'E' in X'45' When using characters with codes X'00' through X'1F', see command SRBR (Write Display Area, section 1.2.2.6).
15	yy		

Byte	Code(Hex)	Meaning	
16	3x	PHYZEG	Physical font X'30' thru X'37' ZEG0 thru ZEG7 fonts for monochrome monitors X'30' thru X'33' ZEG0 thru ZEG3 fonts for color monitors (single-plane). X'34' thru X'37' ZEG4 thru ZEG7 fonts for color monitors (triple-plane).
17	XX....XX	LOGZEG	Symbolic name of font, length 8 bytes
25	3x	Length	Length of continuation X'36' thru byte 30 (6 bytes) X'38' thru byte 32 (8 bytes)
26	30	(res.)	
27	30	MATX	X'3039' character matrix size in X axis = 9 pixels All 9 pixels must always be loaded even if only 6 pixels are displayed, depending on the defined format.
28	39	MATX	
29	3x	MATY	X'3136' character matrix size in Y axis = 16 pixels All 16 pixels must always be loaded even if only 14 pixels are displayed, depending on the defined format.
30	3x	MATY	
31	3x	(res.)	
32	3x	TRIP	X'30' when a triple-plane ZEG is used as single-plane. The ZEGs for all three planes are then loaded with the same data. X'31' loading of the blue color plane X'32' loading of the red color plane X'33' loading of the green color plane
33	xx . . .		Data for loading a font. The data from the data segment is loaded into the ZEG specified in byte 16.
n			

Table 1-17 Structure of "Load Character Generator" command (LZEG)

1.2.2.4 Define Screen (DEBS)

Implemented for the 9763 DDT.

The following formats are possible:

Format	Columns/lines	No. of chars.	Char. matrix x / y	Character area x / y
F1	80 x 24	1920	9 x 16	7 x 12
F2	080 32			1)
F3	080 43			1)
F4	132 x 27	3564	6 x 14	5 x 10

1) Format not defined at time of going to print.

Table 1-18 Screen formats

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	30	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	30		
3	31		
4	32		
5	31	PAFK	Parameter field ID for DEBS
6	30		
7	30	(res.)	
8	3x	ZEILE	X'3234' 24 lines X'3332' Not yet defined X'3433' Not yet defined X'3237' 27 lines
9	3x		
10	3x	SPALTE	X'303830' 80 columns X'303830' Not yet defined X'303830' Not yet defined X'313332' 132 columns
11	3x		
12	3x		

Table 1-19 Structure of "Define Screen" command (DEBS)

1.2.2.5 Reset Screen (RDSS)

Implemented for the 9763 DDT.

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	30	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	30		
3	30		
4	36		
5	30	PAFK	Parameter field for RDSS
6	30		

Table 1-20 Structure of "Reset Screen" command (RDSS)

1.2.2.6 Write Display Area (SRBR)

Implemented for the 9763 DDT.

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	30	PAFK	Parameter field ID for SRBR
6	37		
7	30	BBR	Display area 0
8	30	(res.)	
9	30	(res.)	
10	3x	MODI	X'30' Data not expanded X'31' Data expanded
n	xx		Data field

Table 1-21 Structure of "Write Display Area" command (SRBR)

1.2.2.7 Error Message for Structured Commands

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	31	PAFK	Parameter field ID for KFEM
6	31		
7	3x	STYP	Status type: X'303031'
8	3x		
9	3x		
10 11	xx xx	PAFK (FEM)	Code Command X'3X3X' UANW Unknown command X'3030' RDSS X'3037' SRBR X'3038' LZEG X'3130' DEBS X'3132' STAM X'3230' LSID X'3231' LPBE X'3232' LKTS X'3233' LLOK X'3234' GDAT X'1D28' DEZA X'1D29' EZFA X'1D2C' MOFA
12 13	3x 3x	FEMC	Error code For data segment, see below.

Table 1-22 Structure of error message

Command	Error code	Meaning
UANW X'3X3X'	X'3030'	Unknown command
RDSS X'3030'	X'3030'	Parameter error
SRBR X'3037'	X'3030'	Parameter error
LZEG X'3038'	X'3030' X'3031' X'3035' X'3036'	Parameter error Hardware not available Error in data field ZEG is in use by DDT
DEBS X'3130'	X'3030' X'3031'	Parameter error Hardware not available
STAM X'3132'	X'3030'	Parameter error
LSID X'3230'	X'3030'	Parameter error
LPBE X'3231'	X'3030'	Parameter error
LKTS X'3232'	X'3030'	Parameter error
LLOK X'3233'	X'3030' X'3031'	Parameter error Device inoperable
GDAT X'3234'	X'3030' X'3031'	Parameter error Device inoperable
DEZA X'1D28'	X'3030' X'3032' X'3033'	Parameter error No plane set up for FAT/ZAT No assignment log./phys. ZEG
EZFA X'1D29'	X'3030' X'3032' X'3033'	Parameter error No plane set up for FAT/ZAT No assignment log./phys. ZEG
MOFA X'1D2C'	X'3030' X'3032' X'3033' X'3034'	Parameter error No plane set up for FAT/ZAT No assignment log./phys. ZEG Cursor not positioned at FAT

Table 1-23 Error code list

1.2.3 Message Section with Positioning Commands (IS4 Sequence)

Coding of Line Address

Line	Coding		Line	Coding	
	EBCDIC	ISO-7		EBCDIC	ISO-7
1	07	7F	23	89	69
2	FF	7E	24	88	68
3	FD	7D	25	87	67
4	4F	7C	26	86	66
5	FB	7B	27	85	65
6	A9	7A	28	84	64
7	A8	79	29	83	63
8	A7	78	30	82	62
9	A6	77	31	81	61
10	A5	76	32	4A	60
11	A4	75	33	6D	5F
12	A3	74	34	6A	5E
13	A2	73	35	BD	5D
14	99	72	36	BC	5C
15	98	71	37	BB	5B
16	97	70	38	E9	5A
17	96	6F	39	E8	59
18	95	6E	40	E7	58
19	94	6D	41	E6	57
20	93	6C	42	E5	56
21	92	6B	43	E4	55
22	91	6A			

Table 1-24 Coding of line address

Coding of Column Address

Column address (SPA1)

	Coding			Coding			Coding			Coding	
Column	EBCDIC	ISO-7	Column	EBCDIC	ISO-7	Column	EBCDIC	ISO-7	Column	EBCDIC	ISO-7
1	07	7F	21	92	6B	41	E6	57	61	C3	43
2	FF	7E	22	91	6A	42	E5	56	62	C2	42
3	FD	7D	23	89	69	43	E4	55	63	C1	41
4	4F	7C	24	88	68	44	E3	54	64	7C	40
5	FB	7B	25	87	67	45	E2	53	65	6F	3F
6	A9	7A	26	86	66	46	D9	52	66	6E	3E
7	A8	79	27	85	65	47	D8	51	67	7E	3D
8	A7	78	28	84	64	48	D7	50	68	4C	3C
9	A6	77	29	83	63	49	D6	4F	69	5E	3B
10	A5	76	30	82	62	50	D5	4E	70	7A	3A
11	A4	75	31	81	61	51	D4	4D	71	F9	39
12	A3	74	32	4A	60	52	D3	4C	72	F8	38
13	A2	73	33	6D	5F	53	D2	4B	73	F7	37
14	99	72	34	6A	5E	54	D1	4A	74	F6	36
15	98	71	35	BD	5D	55	C9	49	75	F5	35
16	97	70	36	BC	5C	56	C8	48	76	F4	34
17	96	6F	37	BB	5B	57	C7	47	77	F3	33
18	95	6E	38	E9	5A	58	C6	46	78	F2	32
19	94	6D	39	E8	59	59	C5	45	79	F1	31
20	93	6C	40	E7	58	60	C4	44	80	F0	30

Column address (SPA2)

	Coding			Coding			Coding			Coding	
Column	EBCDIC	ISO-7	Column	EBCDIC	ISO-7	Column	EBCDIC	ISO-7	Column	EBCDIC	ISO-7
81	07	7F	94	99	72	107	85	65	120	E7	58
82	FF	7E	95	98	71	108	84	64	121	E6	57
83	FD	7D	96	97	70	109	83	63	122	E5	56
84	4F	7C	97	96	6F	110	82	62	123	E4	55
85	FB	7B	98	95	6E	111	81	61	124	E3	54
86	A9	7A	99	94	6D	112	4A	60	125	E2	53
87	A8	79	100	93	6C	113	6D	5F	126	D9	52
88	A7	78	101	92	6B	114	6A	5E	127	D8	51
89	A6	77	102	91	6A	115	BD	5D	128	D7	50
90	A5	76	103	89	69	116	BC	5C	129	D6	4F
91	A4	75	104	88	68	117	BB	5B	350	D5	4E
92	A3	74	105	87	67	118	E9	5A	131	D4	4D
93	A2	73	106	86	66	119	E8	59	132	D3	4C

Table 1-25 Coding of column address

Note

When SPA2 is used, SPA1 must be = X'2F'.
When SPA1 is used, SPA2 must be = X'30'.

1.2.4 Message Section with Field Separators (IS2, IS3 Sequences)

The field separators FHC and DCC must always be used together.

Exception:
When a system message is output, no FHCs may be used!

Field Handling Characters (IS2 Sequence)

The following field characteristics can be defined by field handling characters (FHC):

Coding	Field characteristic	Short name	Explanation
Bit 7 6 5 4 3 2 1	Dependent on bit 6 and bit 1:		
0 0	=00: Variable field	V	Fields can be written as desired.
1 0 1	=01: Protected field, cannot be transmitted	G	The field contents cannot be changed via the keyboard. With data input, those fields defined as 'protected and non-transmittable' are not transmitted.
1 0	=10: Protected field, can be transmitted	GU	The field contents cannot be changed via the keyboard. With data input, those fields defined as 'protected and transmittable' are transmitted.
1 1	=11: Protected field, only field addresses can be transmitted	GA	Prerequisite: SAW = X'41', X'45', X'4D'
	=0: Alphanumeric field	A	The input of all displayable characters is possible via the keyboard: numeric characters, alphabetic characters (uppercase/lowercase), special symbols.
Bit 2	=1: Numeric field	N	Only the input of numeric characters and the following special symbols is possible via keyboard: * + , - . /

	=1: Modified field	MO	Modified fields are produced as a result of
			- definition by the CPU,
			- keyboard input
			  - of a valid character,
			  - insertion and deletion of characters,
			  - the function LZF (depends on FST2 of PAROOL),
			- Marking of markable fields.

Bit 3	=0:		The MOD bit is reset - by the character string ESC FAZ (X'1B6D' = ESC m). - automatically after each data output, depending on entries in PAROOL-FST2-FAZ. - by functions LZF and LVD. - by re-marking protected markable fields.
	=0: Non-markable field	NM	The field cannot be marked from the keyboard.
Bit 4	=1: Markable field	MA	The field characteristic "Markable" is effective only in conjunction with an DCC. Markable fields can be marked by means of the MAR key. Marking of a markable field sets the MOD bit in the FHC and the BLI bit in the DCC. Re-marking in protected markable fields causes the MOD bit in the FHC and the BLI bit in the DCC to be reset; in unprotected fields only the BLI bit in the DCC is reset.
	=0: Non-printable field	ND	The field cannot be output on a printer.
Bit 5	=1: Printable field	DR	The field can be output on a printer.

Table 1-26 Field handling characters

Coding of Field Handling Characters

Field characteristic	Coding		Field characteristic	Coding	
	EBCDIC	ISO-7		EBCDIC	ISO-7
V,NM,ND,A	7C	40	GU,NM,ND,A	4A	60
V,NM,ND,N	C2	42	GU,NM,ND,N	82	62
V,NM,DR,A	D7	50	GU,NM,DR,A	97	70
V,NM,DR,N	D9	52	GU,NM,DR,N	99	72
V,MA,ND,A	C8	48	GU,MA,ND,A	88	68
V,MA,ND,N	D1	4A	GU,MA,ND,N	91	6A
V,MA,DR,A	E7	58	GU,MA,DR,A	A7	78
V,MA,DR,N	E9	5A	GU,MA,DR,N	A9	7A
G,NM,ND,A	C1	41	GA,NM,ND,A 1)	81	61
G,NM,ND,N	C3	43	GA,NM,ND,N	83	63
G,NM,DR,A	D8	51	GA,NM,DR,A	98	71
G,NM,DR,N	E2	53	GA,NM,DR,N	A2	73
G,MA,ND,A	C9	49	GA,MA,ND,A	89	69
G,MA,ND,N	D2	4B	GA,MA,ND,N	92	6B
G,MA,DR,A	E8	59	GA,MA,DR,A	A8	79
G,MA,DR,N	BB	5B	GA,MA,DR,N	FB	7B

1) Combinations with GA are not meaningful.

Table 1-27 Coding of field handling characters

Display Control Characters (IS3 Sequence)

The following display characteristics can be defined by display control characters (DCC):

Coding	Display characteristic	Short name	Explanation
Bit 7 6 5 4 3 2 1 1 0 Bit 1	=0: Non-flashing =1: Flashing	NB BL	Characters flash at a frequency of approx. 2 Hz.
Bit 2	=0: Normal display =1: Underscored (or inverse with 9749, or 9750)	NT US	Characters are displayed underscored or inversely. 1)
Bit 3	=0: Visible =1: Invisible	DU	Characters are blanked (in accordance with the background).
Bit 4	=0: Normal intensity =1: Low intensity	NH HH	Characters are displayed at reduced brightness. Contrast ratio for normal/low intensity is adjustable.
Bit 5	=0: Normal display =1: Inverse	NT IT	Characters displayed inversely (only for 9756, 976x DDTs and up)

1) Set by straps or ROM in 9746 through 9752 DDTs.
Set by menu with 9755.
With 9756, 976x DDTs and up the characters are displayed underscored.

Table 1-28 Display control characters

Display Characteristics for Color Terminals

Coding of Display Control Characters

Display characteristic			Coding	
9748, 9749, 9750 9755, 9756	As supplied		EBCDIC	ISO-7
	9752, 9762C,	9763C 1)		
NH, NT, NB	Green	Green	7C	40
NH, NT, BL	Green, flashing	Red	C1	41
NH, US, NB	Red	Red	C2	42
NH, US, BL	Red, flashing	Magenta	C3	43
HH, NT, NB	Yellow	Yellow	C8	48
HH, NT, BL	Yellow, flashing	Cyan	C9	49
HH, US, NB	White	White	D1	4A
HH, US, BL	White, flashing	Blue	D2	4B
DU	Invisible		C4	44

1) The color settings for the 9762 and 9763 DDTs can be changed by means of a SIDATA menu.
For 9762C and 9763C: Choice of 8 possible colors via SIDATA menu.

Table 1-29 Coding of display control characters

1.2.5 Message Section with Field and Character Attributes

1.2.5.1 Field Attribute (FAT)

Field Attribute 1

Default value: BLI, UNT, ZNS, HAH and INV = null.

In order to avoid the creation of data transmission control characters, bit 7 must = 1 for data transfer.

The following display characteristics can be specified:

Bit	Function	Display characteristics
8	(none)	
7	(none)	
6	(none)	(reserved for 8162 DDT)
5	INV	Inverse: Monochrome monitor: When 'Characters dark, background light' is set, the characters in these fields are displayed light on a dark background. Color monitor: Dark character and colored background dependent on SIDATA setting if no FAT2 or ZAT2 present.
4	HAH	Low intensity: Monochrome monitor: Characters are displayed at reduced brightness. Color monitor: Colored character dependent on SIDATA setting if no FAT2 or ZAT2 present.
3	ZNS	Characters invisible: The characters in these fields are invisible. (Example of use: invisible password input)
2	UNT	Underscored: Monochrome monitor: The characters are displayed with underscoring. Color monitor: Colored character dependent on SIDATA setting if no FAT2 or ZAT2 present.

Bit	Function	Display characteristics
1	BLI	Flashing: The BLI bit in the FAT1 is set when a markable field is marked by the DDT. Re-marking, and CPU outputs that affect the display memory, cause the BLI bit to be reset in marked fields. For effects of the functions LZF and LVD, see FST2 characters in PAR OOL. Monochrome monitor: Characters flash. Color monitor: Colored character dependent on SIDATA setting if no FAT2 or ZAT2 present.

Table 1-30 Display characteristics in field attribute 1

Combinations of the individual characteristics are possible.

Field Attribute 2

Default value: FAT1

Field Attribute 3

Default value: ZEG0

Field Attribute 4

Default value: GNU, NUM, MOD, MAR and GÜ = 0, DRU = 1

In order to avoid the creation of data transmission control characters, bit 7 must = 1 for data transfer.

The following field characteristics can be specified:

Bit	Function	Field characteristics
8	(none)	
7	(none)	
6	GÜ	Protected, transmittable: The DDT user cannot change the contents of the fields by entering characters. The contents of these fields are however transmitted to the CPU.
5	DRU	Printable: These fields can be printed by a printer.
4	MAR	Markable: The field characteristic "Markable" is effective only in conjunction with a FAT1. Markable fields can be marked by means of the MAR key. Marking of a markable field sets the MOD bit in the FAT4 and the BLI bit in the FAT1. Re-marking in protected markable fields causes the MOD bit in the FAT4 and the BLI bit in the FAT1 to be reset; in unprotected fields only the BLI bit in the FAT1 is reset.
3	MOD	Modified: The MOD bit in the FAT4 of a field is set by input of valid characters, by insertion or deletion of characters, by marking and by erase functions (see device functions). The MOD bit can also be predefined by the CPU. The MOD bit is reset: - by the character string ESC FAZ (X'1B6D' = ESC m) - automatically after each data output, depending on entries in PAROOL-FST2-FAZ. - by functions LZF and LVD (see PAROOL-FST2). - by re-marking protected markable fields.
2	NUM	Numeric: In numeric fields, only input of the codes X'2A' through X'39' is possible via the keyboard. In the ZEGO these are the digits and the special symbols * + , - . / as per DIN 66003.
1	GNU	Protected, non-transmittable: The terminal user cannot change the contents of the fields by entering characters. The contents of these fields are not transmitted to the CPU.

Table 1-31 Display characteristics in field attribute 4

Combinations of the individual characteristics are possible.

1.2.5.2 Create Field Attributes (EZFA)

Byte	Code (Hex)	Meaning	
1	1D	EZFA	Create field attributes
2	29		
3	3X	ANZ	X'30' All field attributes at this position are set to 'default'. X'31', X'32', X'33' and X'34' Number of character pairs (up to 4)
4	31	EBE	Plane for FAT1
5	XX	FAT1	X'00' = default value (see FAT1) X'XX' = as defined for FAT1
6	32	EBE	Plane for FAT2
7	3x	FAT2 1)	X'00' = default value (see FAT2) X'30' = default value (see FAT2) X'31' = blue X'32' = red X'33' = magenta X'34' = green X'35' = cyan X'36' = yellow X'37' = white
8	33	EBE	Plane for FAT3
9	XX	FAT3	X'00' = default value (see FAT3) X'30' thru X'37' = specifies the physical ZEG
10	34	EBE	Plane for FAT4
11	XX	FAT4	X'00' = default value (see FAT4) X'XX' = as defined for FAT4

Table 1-32 Structure of "Create Field Attributes" command (EZFA)

1) See listing of colors in this section.

1.2.5.3 Modify Field Attributes (MOFA)

Byte	Code(Hex)	Meaning	
1	1D	MOFA	Modify field attributes
2	2C		
3	XX	ANZ	X'00' All FATs are eliminated X'30' Command is ignored X'31', X'32', X'33' and X'34' Number of character pairs (up to 4)
4	31	EBE	Plane for FAT1
5	XX	FAT1	X'00' = default value (see FAT1) X'XX' = as defined for FAT1
8	32	EBE	Plane for FAT2
9	3x	FAT2 1)	X'00' = default value (see FAT2) X'30' = default value (see FAT2) X'31' = blue X'32' = red X'33' = magenta X'34' = green X'35' = cyan X'36' = yellow X'37' = white
6	33	EBE	Plane for FAT3
7	XX	FAT3	X'00' = default value (see FAT3) X'30' thru X'37' = specifies the physical ZEG
10	34	EBE	Plane for FAT4
11	XX	FAT4	X'00' = default value (see FAT4) X'XX' = as defined for FAT4

Table 1-33 Structure of "Modify Field Attributes" command (MOFA)

1) See listing of colors in this section.

1.2.5.4 Character Attributes

Note

When ZAT = ZEG0, the codes X'06' (AM), X'19' (EM) and X'1C' (LZE) in the display area are not treated as characters during data transfer to the CPU. They mark the current write position on initiation of the respective function by means of symbols from the ZEG0.
The corresponding ESC sequences for AM and LZE (for AM: X'1B' X'20' X'50' and for LZE: X'1B' X'71') are transmitted to the CPU instead of these 'markings'. The EM is transmitted only when SAW = X'43'.

Reset Character Attribute (RSZA)

Byte	Code(Hex)	Meaning	
1	1D	AZATT	Character attributes announcer
2	28		
3	00	RSZA	Reset ZAT preset values
4	00		(res.)

Table 1-34 Structure of "Reset Character Attribute" command (RSZA)

Default values after resetting are as follows:

ZAT1 = FAT1
ZAT2 = FAT2
ZAT3 = FAT3

Define Display Attribute (DEAA)

Byte	Code(Hex)	Meaning	
1	1D	AZATT	Character attributes announcer
2	28		
3	31	DEAA	Display attribute plane
4	XX	ZAT1	X'00' = default value X'XX' = as defined for FAT1

Table 1-35 Structure of "Define Display Attribute" command (DEAA)

Default value for ZAT1 = FAT1

Define Color Attributes (DEFA)

Byte	Code (Hex)	Meaning	
1	1D	AZATT	Character attributes announcer
2	28		
3	32	DEFA	Color plane
4	xx	ZAT2	X'00' = default value X'30' = default value X'31' = blue X'32' = red X'33' = magenta X'34' = green X'35' = cyan X'36' = yellow X'37' = white 1)

Table 1-36 Structure of "Define Color Attributes" command (DEFA)

1)	white	for single-plane ZEG
	colored	for triple-plane ZEG

Default value for ZAT2 = FAT2

Representation of Colors

The color settings as supplied are listed below. The color assignment can be changed by means of SIDATA.

Color plane	5 4 3 2 1 Bit FAT1 (DCC)	Color of character
	inverse low intensity invisible underscored flashing	for SIDATA: characters light background dark
without plane for ZAT2 & FAT2	without DCC	green
without plane for ZAT2 & FAT2	0 0 - 0 0 0 0 - 0 1 0 0 - 1 0 0 0 - 1 1 0 1 - 0 0 0 1 - 0 1 0 1 - 1 0 0 1 - 1 1	green red brown magenta yellow cyan white blue
(ZAT2=X'00' or ZAT2=X'30') and (FAT2=X'00' or FAT2=X'30')	0 0 - 0 0 0 0 - 0 1 0 0 - 1 0 0 0 - 1 1 0 1 - 0 0 0 1 - 0 1 0 1 - 1 0 0 1 - 1 1	green red brown magenta yellow cyan white blue
ZAT2=X'00' and	When invisible or inverse is not specified in FAT1.	
FAT2=X'31'		blue
X'32'		red
X'33'		magenta
X'34'		green
X'35'		cyan
X'36'		yellow
X'37'		white

Table 1-37 Representation of colors (as supplied)

Color plane	DCC (FAT1) bit 5 4 3 2 1	background dark color of character
ZAT2	When invisible or inverse is not specified in FAT1.	
X'31'		blue
X'32'		red
X'33'		magenta
X'34'		green
X'35'		cyan
X'36'		yellow
X'37'		white

Table 1-38 Color representation with single-plane ZEG

Color plane	DCC (FAT1) bit 5 4 3 2 1	background dark color of character
ZAT2	When invisible or inverse is not specified in FAT1.	
X'31'		blue
X'32'		red
X'33'		magenta
X'34'		green
X'35'		cyan
X'36'		yellow
X'37'		Color plane green red blue 0 0 0 black 0 0 1 blue 0 1 0 red 0 1 1 magenta 1 0 0 green 1 0 1 cyan 1 1 0 yellow 1 1 1 white

Table 1-39 Color representation with triple-plane ZEG

Color representation when ZAT2 does not equal X'37'

If a pixel is switched on in one of the three planes in a triple-plane ZEG, this pixel will then be displayed in the color specified by ZAT2 (ORing of the three planes). A pixel will only be dark when it is switched off in all three planes.

Color representation when ZAT2 equals X'37'

The color of each individual pixel in the character matrix is produced by additive mixing of the colors from the three color planes.
The intensity of the pixels in the individual color planes can only be switched on or off, where 0 = off and 1 = on.

Define Font (DEZS)

Byte	Code(Hex)	Meaning	
1	1D	AZATT	Character attributes announcer
2	28		
3	33	DEZS	Font plane
4	xx	ZAT3	X'00' = default value X'30' thru X'37' = specifies the physical ZEG

Table 1-40 Structure of "Define Font" command (DEZS)

Default value for ZAT3 = FAT3

1.2.6 Message Section with Device Functions (ESC Sequences)

Coding of the Device Functions

	0	1	2	3	4	5	6	7	
0			SP	AKA	SMR	PAR	RU	BRS	0
1					SML	LA1	P2	LZE	1
2					SMO	LA2	SBA		2
3					SMU	K1	P1		3
4					SNZ	K2	LSP		4
5					SZA	K3	LVD		5
6					TAR	K4	DÜ1		6
7					TAL	K5			7
8					EFG		P3		8
9		EM			AFG		P4		9
A			P5	K14	AFZ		P		A
B		ESC	P6	K13	EFZ	F1	SDZ		B
C				K12	LZF	F2	MAR		C
D				K11	K6	F3	FAZ		D
E				K10	K7	F4	RS		E
F				K9	K8	F5	VA		F
	0	1	2	3	4	5	6	7	

Table 1-41 Device functions of 2-character string

Example

Cursor to start of screen (SBA): ESC–GEF = X'1B62' (ISO 7-bit code).

	0	1	2	3	4	5	6	7	
0			SP		P7	AM			0
1					P8	DÜ2	PAK		1
2					P9	SS	WDH		2
3					P10		LVA		3
4					P11				4
5					P12				5
6					P13				6
7					P14				7
8					P15				8
9					P16				9
A					P17				A
B		ESC			P18	LA3			B
C					P19	LA4			C
D					P20	LA5			D
E						LA6			E
F						LA7			F
	0	1	2	3	4	5	6	7	

Table 1-42 Device functions of 3-character string

Example

Initiation of the P20 function: `ESC–Space–GEF = X'1B204D'` (ISO 7-bit code).

1.2.7 Description of Device Functions

All the following device functions can be initiated by means of a data output.

Cursor Positioning Functions

All positions on the screen can be accessed by means of the cursor positioning functions.

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
SMR	Cursor right	7C	40	The cursor moves 1 position to right in the write direction. On reaching end of screen, the cursor jumps to start of screen.	FST1 (SMF) and FST2 (ATAB) of the PAR 00L: SMF=0 and ATAB=1: Here the cursor skips those write positions in protected, non-markable fields. SMF=0 and ATAB=0, SMF=1 and ATAB=0, SMF=1 and ATAB=1: The cursor also accesses write positions in protected fields. The cursor is positioned in accordance with the activated function without regard to the field definition.
SML	Cursor left	C1	41	The cursor moves 1 position to left against the write direction. On reaching start of screen, the cursor jumps to end of screen.	
SMO	Cursor up	C2	42	The cursor moves up 1 line in the same column. On reaching the first line, the cursor jumps to the same column in the last line.	
SMU	Cursor down	C3	43	The cursor moves down 1 line in the same column. On reaching the last line, the cursor jumps to the same column in the first line.	
SNZ	Cursor to start of next line	C4	44	The cursor jumps to the start of the next line. On reaching the last line, the cursor jumps to the start of the screen.	
SZA	Cursor to start of line	C5	45	The cursor jumps to the start of the line.	

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
SBA	Cursor to start of screen	82	62	The cursor jumps to the start of the screen.	With SBA the cursor jumps to start of screen when FST4 bit 6=1, even if a protected field stands at start of screen.
SDZ	Cursor to start of previous line	92	6B	The cursor jumps to the first column of the previous line. On reaching the first line, cursor jumps to start of last line.	
TAR	Tabulator jump right	C6	46	The cursor jumps 16 positions to the right in the write direction, always to columns 1, 17, 33, 49, 65, (81, 97, 113 and 129) of a line. On reaching the last column of the last line, the cursor jumps to the start of the screen.	The cursor jumps to the first column of the next modifiable field in the write direction.
TAL	Tabulator jump left	C7	47	The cursor jumps 16 positions to the left against the write direction to columns (129, 113, 97, 81,) 65, 49, 33, 17 and 1 of a line. On reaching the start of the screen, the cursor jumps to the last column of the last line.	The cursor jumps to the first column of the next modifiable field against the write direction.

Table 1-43 Cursor positioning functions

Text Manipulation Functions

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
EFG	Insert character	C8	48	Starting from the cursor position, the characters are shifted in the write direction by number of inserted characters. NULs present in the text are overwritten. If no further NULs are present, all following characters are shifted in the write direction. The function is effective beyond end of line. Characters shifted out beyond end of screen are lost. LZE handling: If during insertion an LZE character reaches the start of a physical line, the characters of this and the following lines will then be shifted in the write direction until the conditions applying to the logical end of line are met. The EFG function is deactivated by means of 'RS' and 'LSP'. Inserting an LZE: The character at the cursor position and all characters to the right of it up to end of line are shifted to start of next line on inserting an LZE; the LZE is "inserted" at the cursor position. NUL characters are written to the remainder of the line. NUL characters between other characters in the following lines are overwritten. If there are insufficient NUL characters between the cursor position and the end of the display area, characters at end of screen are lost.	Operates as in unformatted mode, except that the EFG function remains restricted to an unprotected field. Characters shifted out beyond the end of the field are lost. Display control characters are not shifted and remain unaffected. When a character is inserted via the keyboard, the MOD bit is set in the FHC. Inserting an LZE: The character at the cursor position and all characters to the right of it up to end of field are overwritten with NUL if the field ends in the same line. If the field ends in a subsequent line, the characters starting at the cursor position are inserted at the start of the next line. The characters at the start of the next line are shifted to the right. NUL characters are overwritten here. If there are insufficient NUL characters between the start of the next line and the end of the field, then the characters at the end of the field will be lost. If the field contains further LZE characters, then only NUL characters may follow the LZE up to end of line or end of field. After insertion of an LZE, the cursor appears at the start of the next line if the field also occupies write positions in this line; otherwise it appears at the start of the next field.

AFG	Delete character	C9	49	Deleting characters other than NUL: The character at the cursor position is deleted and the following characters up to the next NUL character or end of screen are shifted against the write direction. Positions vacated are occupied by NUL characters. Deleting a NUL: The next non-NUL characters to the right of the cursor up to the next NUL character or end of screen are shifted against the write direction. Positions vacated are occupied by NUL characters.	Operates as in unformatted mode, except that function ends at end of field of an unprotected field. When deleting via the keyboard, the MOD bit is set in the FHC.
EFZ	Insert line Lockable for the operator in char. FST1 of the PAR OOL.	D2	4B	The characters in the line containing the cursor and the characters in the following lines are all shifted down by one line. When EFZ=0, the characters from the last line are lost. NUL characters are written to line containing the cursor. When EFZ=1, the characters from the last line are copied to the line containing the cursor.	The characters in the line containing the cursor and the characters in the following lines are all shifted down by one line. The last line is copied to the line containing the cursor. When EFZ=0, the characters in the unprotected fields are then overwritten with NUL. When EFZ=1, the contents of the line remain unchanged. If all characters begin with field separators (FHC and DCC), the fields then retain their characteristics. If there are no field separators at the start of a line, then the characters up to the first start of field in this line assume the field characteristics of the last field of the previous line.

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
AFZ	Delete line Lockable for the operator in char. FST1 of the PAR OOL.	D1	4A	The characters in the line containing the cursor are copied to the last line and the characters in the following lines are all shifted up by one line. When AFZ=0, the last line is overwritten with NUL.	The characters in the line containing the cursor are copied to the last line and the characters in the following lines are all shifted up by one line. The cursor remains positioned in the line. When AFZ=0, the characters in the unprotected fields of the last line are then overwritten with NUL. When AFZ=1, the contents of the line remain unchanged. If all characters begin with field separators, the fields then retain their characteristics. If there are no field separators at the start of a line, then the characters up to the first start of field in this line assume the field characteristics of the last field of the previous line.
RU	Roll-up function Lockable for the operator in char. FST1 of the PAR OOL.	4A	60	The characters from the second to the last lines are shifted up by one line. The characters from the first line are lost. NUL characters appear in the last line; cursor is posipositioned at start of last line.	Operates as in unformatted mode. Field separators are also shifted. The last line contains no field separators. The field separators in the first line are lost.

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
RUB	Roll-up mode Can be switched on/off by specification in char. FST1 of the PAR OOL.	—	—	After the last write position of the last line has been written to, the characters of the second to the last lines are all shifted up by one line. The characters from the first line are lost. NUL characters appear in the last line. The cursor is positioned at the start of the last line. When an LZE is entered in the last line - remainder of last line is overwritten with NUL, - the Roll-up function is executed, - the cursor is positioned to the start of the new last line.	Operates as in unformatted mode, but including all field separators. *Note:* When RU mode and ATAB are used, the last character present on the screen must be contained in an unprotected field.

Table 1-44 Text manipulation functions

Erase Functions

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
LSP	Erase memory contents Initiated by GEF1 of PAR 00D or by the LSP key (can be locked by specification in the FST2 of the PAR 00)L.	84	64	Following are erased: - from start to end of screen; screen is overwritten with NUL. - PAR 00L - PAR 10L - PAR 70L (depending on FST2 of the PAR 00L).	Operates as in unformatted mode, except that all FTZs are also erased.
	Initiated by an ESC sequence in the text.			Erase from cursor to end of screen. The cursor position remains unchanged. Parameter areas are not erased.	Operates as in unformatted mode, except that all FTZs are also erased.
LVD	Erase variable data	85	65	Erase from cursor to an EM inclusive or to end of screen (replaced by NUL characters). The cursor position remains unchanged.	When LVD=0, all characters, the MOD bit and the BLI bit are erased in unprotected fields from cursor to EM or to end of screen. In the field containing the cursor, the BLI bit is erased only if the field is also markable. When LVD=1, all characters, the MOD bit and the BLI bit are erased in unprotected fields from start of screen to EM or to end of screen. The cursor position remains unchanged.
				The erase limits to EM or end of screen are defined in the PAR 00L, FST2: bit 6=0: from cursor to EM bit 6=1: start of screen to end of screen	

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
LZF	Erase to end of line or end of field	D3	4C	Erase from cursor to end of line or to an end marker (EM) inclusive. The cursor position remains unchanged.	All characters of an unprotected field are erased from cursor to end of field, or to an EM inclusive, in the same field. The cursor position remains unchanged. Handling of the MOD and BLI bits in the FTZs is defined in the PAR OOL, FST2, bit 5.
LVA	Erase variable data to address	83	63	All variable data from the current cursor position to the specified address is erased. The address specified in the string indicates the position of the first character not to be erased. If the specified address precedes the current write position, then all characters from the write position to end of screen and from start of screen to the specified address are overwritten with NUL. MOD bits remain unchanged. *Note* The function LVA can only be entered in the text segment. The entries for the line address must contain values from Table 1-24; the entries for the column address must contain values from Table 1-25. Announcers (IS4) and entries for page address are not required. **Example** To erase the variable data from start of screen to line 10, column 1: ESC-SBA-ESC-SP-LVA-ZLA-SPA1-SPA2 = X'2782274083A507F0' (coding in EBCDIC).	

Table 1-45 Erase functions

Data Transmission Functions

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
DÜ1	Initiate data transfer by means of function DÜ1	86	66	When a DÜ function is initiated, a send request (SAN) is made to the CPU; the SAN indicator lights up on the screen. SAN can be reset by means of RS. Transfer of the message takes place in accordance with the entries in character 1 (SAW1) of the parameter area PAR 00L. The code of the send key used is transferred in character 7 (CDS) of the PAR 00E.	
DÜ2	Initiate data transfer by means of function DÜ2	D8	51	Function execution as under DÜ1. Transfer of the message takes place in accordance with the entries in character 6 (SAW2) of the parameter area PAR 01L. The code of the send key used is transferred in character 7 (CDS) of the PAR 00E.	
K1	Initiate short message via the keyboard or from the CPU by means of the function Kx	E2	53	Initiation with keys K1 - K3	
K2		E3	54		
K3		E4	55		
K4		E5	56	Initiation with ESC key and one of the keys given here: V - K4	
K5		E6	57	W - K5	
K6		D4	4D	M - K6	
K7		D5	4E	N - K7	
K8		D6	4F	O - K8	
K9		6F	3F	? - K9	
K10		6E	3E	> - K10	
K11		7E	3D	= - K11	
K12		4C	3C	< - K12	
K13		5E	3B	; - K13	
K14		7A	3A	: - K14	
				The code of the K function used is transferred in character 7 (CDS) of the PAR 00E. The short message can comprise the PAR 00E, the PAR 01E, the PAR 02E and a text identifier. Initiation of a K function is possible also when the keyboard is locked and also in interactive mode after dialog has commenced. If a K function is to be initiated by the CPU, then the appropriate coding must be entered in character 1 (GEF1) of the PAR 00D.	

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
F1	Initiate	BB	5B	Initiation with keys F1 – F3	
F2	a data	BC	5C		
F3	transfer	BD	5D		
——	by means				
F4	of	6A	5E	The code of the F function used is entered in character 7 (CDS) of the PAR 00E.	
F5	function	6D	5F		
F6	Fx	97	70		
F7		98	71	The message on the screen and the message header are transmitted. If an F function is to be initiated by the CPU, then the appropriate coding must be entered in character 1 (GEF1 and possibly GEF2) of the PAR 00D.	
F8		99	72		
F9		A2	73		
F10	+	A3	74		
F11		A4	75		
F12	spatie	A5	76		
F13		A6	77		
F14		A7	78	*Note* The SAW restricts the number of transmittable characters.	
F15		A8	79		
F16		A9	7A		
F17		FB	7B		
F18		4F	7C		
F19		FD	7D		
F20		FF	7E		
F21		93	6C		
F22		94	6D		
F23		95	6E		
F24		96	6F		

Table 1-46 Data transmission functions

Functions for Data Exchange between DDT and Centrally Connected Printer

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
LA1	Local	D8	51	Depending on the entries in the parameter areas PAR 10L/D-PAR 70L/D, a printer connected locally to the DDT and addressed in accordance with the parameter entries, or a printer terminal connected to the same cluster controller, is addressed.	
LA2	initiat.	D9	52		
LA3		BB	5B		
LA4	Initiat.	BC	5C		
LA5	LA1 – LA2	BD	5D		
LA6	directly	6A	5E		
LA7	via the	6D	5F		
	keyboard and LA3 – LA7 by ESC seq. or LA1 – LA7 by the CPU		+X'20'	All characters from cursor to EM or end of screen are printed.	All fields defined as printable are printed from the cursor position to an end marker or to end of screen. Printer control characters in printable fields are interpreted in accordance with the specifications in the print command (PAR 10L/D-70L/D.

Table 1-47 Functions for data exchange between DDT and centrally connected printer

Programmable Key Functions

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
P	Turn P mode on/off	91	6A	The P function activates/deactivates P mode. The P-areas can be loaded in P mode.	
P1	Select a P-area 1 - 20	83	63	STORAGE CAPACITY AND ENTRY OF CHARACTERS: Up to 16 characters can be entered in a P-area. 1) Text, device control and field separator characters (e.g. ESC; IS2, IS3, IS4 sequences) can be stored. The characters are not interpreted during loading. CHAINING OF P FUNCTIONS: 1) In order to chain a number of P functions, the code of another P function can also be entered in a P area, but the latter must have a greater weight than the P-area to be loaded. *Important:* The function 'DÜ' should be present only once. In character 4 (FST6) of the PAR 01L, a USER LOCK can be entered: - for P1-P5 individually, - for P6-P20 jointly. In character 5 (FST7) of the PAR 01L, a LOAD LOCK can be entered: - for P1-P5 individually, - for P6-P20 jointly. It is thus possible to reserve P-areas for the CPU. Loading of these P-areas from the keyboard is inhibited INITIATION BY THE CPU: Initiation by means of device control characters in the message or in the PAR 00D. If the P-area contains a function invalid during a data output, such as DÜ, K, F or LA, that function will not be interpreted and execution of the P function will be continued.	
P2		81	61		
P3		88	68		
P4		89	69		
P5		5C	2A		
P6		4E	2B		
P7		7C	40		
P8		C1	41		
P9		C2	42		
P10		C3	43		
P11		C4	44		
P12	+	C5	45		
P13	x'20	C6	46		
P14		C7	47		
P15		C8	48		
P16		C9	49		
P17		D1	4A		
P18		D2	4B		
P19		D3	4C		
P20		D4	4D		

1) With the 9755 DDT and up, the storage capacity is limited to 512 characters as the total of all the registers. The length of the individual registers is variable. Chaining is no longer meaningful.

Table 1-48 Programmable key functions

Special Functions

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
FAZ	Set field separators to initial status	94	6D		The MOD bits (= bit 3) in all FHCs and the BLI bits (= bit 1) in the DCCs of the markable fields are erased. In character 3 (FST2) of the PAR 00L it is also possible to specify whether this function is to be initiated only on receipt of the device function or automatically after each data output.
MAR	Mark a field	93	6C	Input of 'MAR' is ignored. The Mark function is effective only in formatted mode.	Markable fields begin with FHC (bit 4=1) and DCC. A field can be marked when it contains the cursor and the MAR function is executed (MOD bit in the FTZ and BLI bit in the DCC are set). The marked field starts to flash as a visual acknowledgment. Each further marking action deactivates or reactivates the function in PROTECTED FIELDS. With UNPROTECTED FIELDS, the MOD bit remains set.
RS	Reset	95	6E	Resets the error indicators and operating states without changing the data memory contents.	
VA	Clear connection	96	6F	ONLY FOR SINGLE TERMINALS (DDT-S): On completion of a current data transmission (DÜ) function, the connection is cleared down by the DDT.	
AM	Beginning marker	D7	50	Unprotected fields (with NULs) inclusive of AM and character at cursor position are transmitted if the corresponding SAW is entered. The AM is interpreted only during data input. X'48' must be specified in character 1 (SAW1) of the PAR 00L or in character 6 (SAW2) of the PAR 01L. The last AM before the cursor is always interpreted. If the AM is missing, transmission takes place from start of screen. The AM has no effect at end of screen.	

Function		Coding		Execution	
		EBCDIC	ISO-7	Unformatted mode	Formatted mode
EM	End marker	19	19	The end marker allows the following functions to be delimited: - printout of a message, - erase operation apart from LSP, - data input. FOR DATA INPUT, THE END MARKER MUST BE CONTAINED IN A TRANSMITTABLE FIELD.	
BEL	Visual alarm	2F	07	When the control character BEL is received, 'BEL' flashes in the indicator line (audible alarm also sounds, if installed). BEL can be used, for example, as an output announcer. BEL is reset by means of the function BRS. *Note* This function is possible only with MSV.	
BRS	Reset BEL	97	70	When this device function is received, the 'BEL' indicator is reset.	
AKA	Audible alarm	F0	30	When the control character AKA is received, an audible alarm (if installed) sounds and the 'BEL' indicator appears. EXAMPLE OF USE: The AKA is initiated at the end of a data output in order to draw the operator's attention to the end of output. THE 'BEL' INDICATOR IS RESET by means of the function BRS or RS.	
SS	Set cursor	D9	52	The function SS is used to store the current write position (line and column). This function cannot be initiated by the operator. If the message begins with the function SS, then after receipt of the message in the display area the cursor will again stand in its old position. If the message contains an SS function, then after receipt of the message the cursor will stand in the write position it occupied when this SS function was processed. If the message contains further SS functions, then after receipt of the message in the display area the cursor will stand in the write position it occupied when the last SS function was processed.	

Function	Coding		Execution	
	EBCDIC	ISO-7	Unformatted mode	Formatted mode
WDH Repeat	82	62	Duplicates a character up to a prespecified line/column address. The duplication acts in the same way as a data output of the corresponding number of characters. Field separators are overwritten when the function is initiated by the CPU. The function acts from the cursor position to the address specified under ZLA and SPA. If invalid addresses are specified, the function is not executed. If the specified address precedes the current write position, the repeat function acts beyond end of screen up to the specified address. If the specified address corresponds to the current write position, then the entire display memory will be filled with the predefined character. *Note* The function WDH can only be entered in the text segment. **Example** To write letter 'A's to line 1: ESC-SBA-ESC-SP-WDH-ZLA-SPA1-SPA2-A = X'2782274082FF07F0C1' (coding in EBCDIC).	
LZE Logical end of line	98	71	The logical lines begin at start of line and end with LZE. They can be part of a line or several lines long. The cursor accesses all cursor positions. All characters after LZE are erased to end of line.	The logical lines begin at start of field and end with LZE. They can be part of a line or several lines long. The cursor accesses all cursor positions. All characters after LZE are erased to end of field or to end of line. Field separators are not erased.

Table 1-49 Special functions

1.2.8 Operation with Status Messages

Implemented for the 9758, 9762 and 9763 DDTs.

1.2.8.1 Query

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	30	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	30		
3	30		
3	39		
5	31	PAFK	Parameter field ID for STAM
6	32		
7	30	MODE	X'30' Status message for the next input
8	3x	KOMP	X'3030' Configuration X'3031' Monitor X'3032' Program version X'3231' Display area
9	3x		

Table 1-50 Structure of query

1.2.8.2 Query Reply

Structure of Configuration Query Reply

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	31	PAFK	Parameter field ID for STAM
6	32		
7	3x	STYP	Status type: X'303031'
8	3x		
9	3x		
10	30	KOMP	X'3030' Configuration
11	30		
12	3x	MONTYP	Monitor: X'30' Monochrome monitor Characters dark, background light X'31' Color monitor Characters colored, background dark X'32' Monochrome monitor Characters light, background dark X'33' Color monitor Characters dark, background colored
13	3x	FKTUMF	Functional scope: X'30' 7-bit ISO 646 X'31' 8-bit ISO 8859-i
14	3x	TYP	X'30' DIALOG X'31' BERMUDA X'32' GRAFIK

Byte	Code(Hex)	Meaning	
15	xx	TAST	Selected keyboard variant: X'30' Own variant X'31' International X'32' German X'33' International A X'34' Great Britain X'35' France X'36' Italy X'37' Spain X'38' Denmark X'39' Sweden (free coding options are reserved for future use)
16	xx	ZEGO	Selected font variant: X'30' Own variant X'31' International X'32' German X'33' International A X'34' Great Britain X'35' France X'36' Italy X'37' Spain X'38' Denmark X'39' Sweden (free coding options are reserved for future use)
17	3x	ANZO	Number of peripheral configuration ports
18	xx	ANS1	Peripheral configuration X'00' Port not used X'20' Catalog X'21' 9001 Printer SS97 X'22' 9004 Printer SS97 X'23' 9012 Printer SS97 X'24' 9013 Printer SS97 X'25' 9011 Printer SS97 X'2C' 9022 Printer V.24 X'2D' 9009 Plotter V.24 X'2F' 4696 Printer CEN X'30' PT88 Printer CEN X'40' 9007 ID card reader SS97 X'41' 9935 CKT CS SS97 X'42' 9935 HKT HS SS97 X'44' Mouse V.24 X'45' Tablet V.24 X'50' 97801 EMU SS97 X'52' Graphic program (9754 EMU) X'53' SINIX printer SS97

Byte	Code(Hex)	Meaning	
19	xx	ANS2	(ANS2 thru ANS7, see ANS1)
20	xx	ANS3	
22	xx	ANS4	
23	xx	ANS5	
24	xx	ANS6	
25	xx	ANS7	
26 27	3x 3x	ANZ1	Number of usable fonts
28	3x	PHYZEG0	X'31' Single-plane X'32' Triple-plane
29	3x	PHYZEG1	X'31' Single-plane X'32' Triple-plane
30	3x	PHYZEG2	X'31' Single-plane X'32' Triple-plane
31	3x	PHYZEG3	X'31' Single-plane X'32' Triple-plane
32	3x	PHYZEG4	X'31' Single-plane X'32' Triple-plane
33	3x	PHYZEG5	X'31' Single-plane X'32' Triple-plane
34	3x	PHYZEG6	X'31' Single-plane X'32' Triple-plane
35	3x	PHYZEG7	X'31' Single-plane X'32' Triple-plane
36 37	3x 3x	ANZ2	Number of usable structured commands (fields)
38 39	3x 3x	PAFK	Code Command X'3030' RDSS X'3037' SRBR X'3038' LZEG X'3130' DEBS X'3132' STAM X'3230' LSID X'3231' LPBE X'3232' LKTS X'3233' LLOK X'3234' GDAT (two bytes per command)

Byte	Code(Hex)	Meaning	
40	3x	ANZ3	Number of structures
41	3x		
42	3x		Type of structure: X'30' Alpha format specifications X'31' Graphic format specifications X'32' Font specifications
43	3x	ZEILE	Number of lines
44	3x		
45	3x	SPLAT	Number of columns
46	3x		
47	3x		
48	3x	XZMAT	Number of pixels of a character box in the X axis (gross area)
49	3x		
50	3x	YZMAT	Number of pixels (video lines) of a character box in the Y axis (gross area)
51	3x		
52	3x	XZFLA	Number of pixels in the X axis for displaying a character (net area)
53	3x		
54	3x	YZFLA	Number of pixels (video lines) in the Y axis for displaying a character (net area)
55	3x		
56	3x	ANZ4	Number of structures
57	3x		
58	3x		Type of structure: X'30' Alpha format specifications X'31' Graphic format specifications X'32' Font specifications
59	3x	XFGBB	Format of the graphic display area Pixels in the X axis
60	3x		
61	3x		
62	3x		
63	3x	YFGBB	Format of the graphic display area Pixels in the Y axis (video lines)
64	3x		
65	3x		
66	3x		
67	3x	XFGBF	Format of the graphic display window Pixels in the X axis
68	3x		
69	3x		
70	3x		
71	3x	YFGBF	Format of the graphic display window Pixels in the Y axis (video lines)
72	3x		
73	3x		
74	3x		

Table 1-51 Structure of configuration query reply

Structure of Monitor Query Reply

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	31	PAFK	Parameter field ID for STAM
6	32		
7	3x	STYP	Status type: X'303031'
8	3x		
9	3x		
10	30	KOMP	X'3031' Monitor
11	31		
12	3x	BSFO	Screen format: lines x columns X'31' 24 x 80 X'32' 32 x 80 X'33' 43 x 80 X'34' 27 x 132
13	3x	ANZ	Number of fonts
14	3x		
15	xx	PHYZEGO	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
16-23	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
24	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG

Byte	Code(Hex)	Meaning	
25	xx	PHYZEG1	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
26-33	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
34	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG
35	xx	PHYZEG2	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
36-43	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
44	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG
45	xx	PHYZEG3	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
46-53	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
54	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG
55	xx	PHYZEG4	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
56-63	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
64	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG
64	xx	PHYZEG5	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
66-73	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
74	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG

Byte	Code(Hex)	Meaning	
75	xx	PHYZEG6	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
76-83	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
84	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG
85	xx	PHYZEG7	X'30' not loaded X'31' loaded by DDT X'32' loaded by CPU X'37' loaded by CPU, and triple-plane ZEG
86-93	XX....XX		Assigned symbolic name of the ZEG (length 8 bytes)
94	3x		X'31' = single-plane ZEG X'32' = triple-plane ZEG

Table 1-52 Structure of monitor query reply

Structure of Program Version Query Reply

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	31	PAFK	Parameter field ID for STAM
6	32		
7	3x	STYP	Status type: X'303031'
8	3x		
9	3x		
10	30	KOMP	X'3032' Program version
11	32		
12 . n	xx		For data segment, see next page.

Table 1-53 Structure of program version query reply

Data segment:	Meaning:
	VDU program:
5638302E3x3x (V80.XX)	DIALOG
5638312E3x3x (V81.XX)	BERMUDA
5638322E3x3x (V82.XX)	GRAFIK
5638332E3x3x (V83.XX)	DIALOG FARBE
	Transmission program:
5538312E3x3x (U81.XX)	BAM - WT (coded di-phase method)
5538322E3x3x (U82.XX)	HDLC - alternating pulse edge transmission method, 2-wire
5538332E3x3x (U83.XX)	HDLC - V.24/ leased data circuit
5538342E3x3x (U84.XX)	HDLC - V.24/ V.25 bis
	Program module:
4B30312E3x3x (K01.XX)	Program catalog
	Drivers:
5430312E3x3x (T01.XX)	9001 Printer S97
5430322E3x3x (T02.XX)	9011 Printer S97
5430332E3x3x (T03.XX)	9012 Printer S97
5430342E3x3x (T04.XX)	9013 Printer S97
5430392E3x3x (T09.XX)	9022 Printer V24
5431302E3x3x (T10.XX)	9009 Plotter V24
5431312E3x3x (T11.XX)	PT88 Printer CEN
5431332E3x3x (T13.XX)	4696 Printer CEN
5431342E3x3x (T14.XX)	97801 Emulation
5431372E3x3x (T17.XX)	9007 ID card reader S97
5431382E3x3x (T18.XX)	9935 HKT HS S97
5431392E3x3x (T19.XX)	9935 CKT CS S97
5432302E3x3x (T20.XX)	Mouse V24
5432312E3x3x (T21.XX)	Tablet V24
5432322E3x3x (T22.XX)	Graphic program (9754 EMU)
5432332E3x3x (T23.XX)	SINIX-DRUCK S97

The revision level of the relevant program is specified in positions 3x3x.

The order of the individual data segments in the data field is not defined.

Structure of Display Area Query Reply

Byte	Code(Hex)	Meaning	
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	30	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	30		
3	31		
4	37		
5	31	PAFK	Parameter field ID for STAM
6	32		
7	3x	STYP	Status type: X'303031'
8	3x		
9	3x		
10	32	KOMP	X'3231' Display area
11	31		
12	30	BBR	Display area 0
13	3x	ZEGA	X'30' = without planes for character and field attributes X'31' = with planes for character and field attributes
14	3X	MODI	X'30' without pixel widening X'31' with pixel widening
15	3x	DBRX	Dimension X of the logical display area decimal with leading zeros up to 132 columns due to absolute positioning
16	3x		
17	3x		

Table 1-54 Structure of display area query reply

1.2.9 Chip Card Terminal (CKT) Connection

1.2.9.1 Data Transmission from CPU to CKT

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	32	PAFK	Parameter field ID for LLOK message to local devices
6	33		
7	3x	GTYP	X'30' = input device
8	3x	GER	X'30' = 9935 CKT
9	30	(res.)	
10	3x	MODI	X'30' Data not expanded X'31' Data expanded
11	30	(res.)	
12	30	(res.)	
13	30	(res.)	
14	30	(res.)	
n	xx		Data field of a CKT message.

Table 1-55 Structure of a CKT message from CPU to DDT

Coding in data field for transmission in expanded mode

Each two characters from the data field that are received are combined to form one character and passed to the CKT.

Each halfbyte of the 8-bit hex code must be converted into an ISO 7-bit code in accordance with the following rule before transmission from the CPU to the DDT.

2^7	2^0
High-order halfbyte	Low-order halfbyte

Hex code from the central authorization terminal to CKT

```
Hex halfbyte               ISO 7-bit code
X'0' ... X'9'   ====>      X'30' ... X'39'
X'A' ... X'F'   ====>      X'41' ... X'46'
```

The high-order halfbyte of the hex code is transmitted before the low-order halfbyte.

1.2.9.2 Data Transmission from CKT to CPU

Byte	Code(Hex)	Meaning	
/	40	NBZ	Start-of-message character
/	1B	PAF	Parameter field announcer
/	20		
/	65		
1	3n	Length	The length, including length field, should be specified as a decimal value with leading zeros.
2	3n		
3	3n		
4	3n		
5	32	PAFK	Parameter field ID for LLOK message from a local device
6	33		
7	3x	GTYP	X'30' = input device
8	3x	GER	X'30' = 9935 CKT
9	30	(res.)	
10	3x	MODI	X'30' Data not expanded X'31' Data expanded
11	30	(res.)	
12	30	(res.)	
13	30	(res.)	
14	30	(res.)	
n	xx . . .		Data field of a CKT message. From each character in the CKT, two characters are formed for transmission.

Table 1-56 Structure of a CKT message from DDT to CPU

Coding in data field for transmission in expanded mode

The data from the CKT is processed by the CKT driver and then inserted in the data field of the message.

Here each halfbyte of the 8-bit hex code from the CKT is converted into an ISO 7-bit code in accordance with the following rule for transmission:

2^7	2^0
High-order halfbyte	Low-order halfbyte

Hex code from the CKT device to the central authorization terminal

Hex halfbyte		ISO 7-bit code
X'0' ... X'9'	===>	X'30' ... X'39'
X'A' ... X'F'	===>	X'41' ... X'46'

The high-order halfbyte of the hex code is transmitted before the low-order halfbyte.

2 Printer Operation

2.1 Message Structure

The message structure depends on

- operating mode and
- configuration.

The corresponding differences are to be found in the

- message headers and the
- parameter areas.

2.1.1 Unsolicited Print Output

2.1.1.1 Print Output to a Locally Connected Printer (Bypass Mode)

Display ISO 7-bit EBCDIC	@ 40 7C	ESC 1B 27	SP 20 40	a 61 81	PAD1	@ 40 7C	NUL 00 00	’ 60 4A	1 31 F1	S 53 E2	@ 40 7C	RB1	RB2	X	! 21 5A
	NBZ	Parameter announcer			PAR address		Parameter entries								Termination char.

ESC 1B 27	SP 20 40	a 61 81	H 48 C8	@ 40 7C	Q 51 D8	X	X	A 41 C1	@ 40 7C	X	X	X	! 21 5A	TEXT
Parameter announcer			PAR address		Parameter entries								Termination char.	

Fig. 2-1 Structure of message header for unsolicited print output

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

PAD1: Parameter address first byte

Displ.	ISO 7-bit	EBCDIC	PARAMETER
I	49	C9	PAR10D
J	5A	D1	PAR20D
K	5B	D2	PAR30D
L	5C	D3	PAR40D
M	5D	D4	PAR50D
N	5E	D5	PAR60D
O	5F	D6	PAR70D

Table 2-1 Parameter address first byte

RB1 and RB2: Return bytes

Messages can be identified by means of these two bytes.

Range of values: RB1 and RB2 can have values between X'20' and X'7F'
(ISO 7-bit) (see also section 2.2.2).

2.1.1.2 Print Output to a Centrally Connected Printer

Structure of message header

Display ISO 7-bit EBCDIC	H 48 C8	X	C 43 C3	X	S 53 E2	’ 60 4A	RB1	RB2	X	TEXT
	NBZ	Parameter entries								

Fig. 2-2 Structure of message header for print output to a centrally connected printer

After output of a file, the printer must be released again for hardcopy mode (see sections 2.1.2 and 2.1.3) by means of the following message:

Display ISO 7-bit EBCDIC	H 48 C8	X	@ 40 7C	X	S 53 E2	@ 40 7C	X	X	X
	NBZ	Parameter entries							

Fig. 2-3 Message for releasing the printer

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

RB1 and RB2: Return bytes

Messages can be identified by means of these two bytes.

Range of values: RB1 and RB2 can have values between X'20' and X'7F' (ISO 7-bit) (see also section 2.2.2).

2.1.2 Hardcopy Mode (Manual)

When one of the following message headers is output, this sets the conditions that allow the operator to start a hardcopy print by means of key LA1 or LA2 (printer 1/printer 2). This option remains open until the corresponding parameter is deleted.

2.1.2.1 Print Output to a Locally Connected Printer

Structure of message header

Display ISO 7-bit EBCDIC	@ 40 7C	ESC 1B 27	SP 20 40	a 61 81	PAD1	@ 40 7C	NUL 00 00	@ 40 7C	1 31 F1	S 53 E2	@ 40 7C	X	X	X	! 21 5A	TEXT
	NBZ	Parameter announcer			PAR address		Parameter entries								Termination char.	

Fig. 2-4 Structure of message header for print output to a locally connected printer

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

PAD1: Parameter address first byte

Displ.	ISO 7-bit	EBCDIC	PARAMETER	Key
A	41	C1	PAR1OL	LA1
B	42	C2	PAR2OL	LA2

Table 2-2 Parameter address first byte

2.1.2.2 Print Output to a Centrally Connected Printer

Structure of message header

Display	@	ESC	SP	a	PAD1	@	KAN	@	1	S	@	X	X	X	!	TEXT
ISO 7-bit	40	1B	20	61		40		40	31	53	40				21	
EBCDIC	7C	27	40	81		7C		7C	F1	E2	7C				5A	
	NBZ	Parameter announcer			PAR address		Parameter entries								Termination char.	

Fig. 2-5 Structure of message header for print output to a centrally connected printer

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

PAD1: Parameter address first byte

Displ.	ISO 7-bit	EBCDIC	PARAMETER	Key
A	41	C1	PAR1OL	LA1
B	41	C2	PAR2OL	LA2

Table 2-3 Parameter address first byte

KAN: Values for channel address

For connection to 8170 LCC, 8171 RCC, 9155 CC (without program YQUER in PDN)

Address LCC and RCC	EBCDIC	40	7F	5B	50	4D	5C	6B	4B	F0	F2	F4	F6	F8	7A	4C	6E	5A	7B	6C	7D	5D	4E	60	61	F1	F3	F5	F7	F9	5E	7E	6F
	ISO-7	20	22	24	26	28	2A	2C	2E	30	32	34	36	38	3A	3C	3E	21	23	25	27	29	2B	2D	2F	31	33	35	37	39	3B	3D	3F
Address CC	EBCDIC	40	5A	7F	7B	5B	6C	50	7D	4D	5D	5C	4E	6B	60	4B	61	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	7A	5E	4C	7E	6E	6F
	ISO-7	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
Channel		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Table 2-4 Values for channel address

The channel is defined by the connection of the printer to the cluster controller.

For connection to BAST, 8171 RCC, 9155 CC of a TC/CFEP/FEP with the program YQUER:

Definition of a printer as the receiving printer for the central output is effected during generation and is controlled by the program YQUER.

Example

KAN = X'20' (ISO 7-bit) means that the first printer provided for central output is addressed.

2.1.2.3 Print Output to another Locally Connected Printer

Only possible for connection to BAST, 8171 RCC, 9155 CC of a TC/CFEP/FEP with the program YQUER:

Definition of a printer as the receiving printer for the central output is effected during generation and is controlled by the program YQUER.

Example

KAN = X'20' (ISO 7-bit) means that the first printer provided for central output is addressed.

2.1.3 Hardcopy Mode (Programmed)

2.1.3.1 Print Output to a Locally Connected Printer

Structure of message header

Display	@	ESC	SP	a	PAD1	@	NUL	@	1	S	@	X	X	X	!
ISO 7-bit	40	1B	20	61		40	00	40	31	53	40				21
EBCDIC	7C	27	40	81		7C	00	7C	F1	E2	7C				5A
	NBZ	Parameter announcer			PAR address		Parameter entries								Termination char.

ESC	SP	a	H	@	Q	X	X	@	@	X	X	X	!	TEXT
1B	20	61	48	40	51			40	40				21	
27	40	81	C8	7C	D8			7C	7C				5A	
Parameter announcer			PAR address		Parameter entries								Termination char.	

Fig. 2-6 Structure of message header for print output to a locally connected printer

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

PAD1: Parameter address first byte

Displ.	ISO 7 bit	EBCDIC	PARAMETER
I	49	C9	PAR10D
J	4A	D1	PAR20D
K	4B	D2	PAR30D
L	4C	D3	PAR40D
M	4D	D4	PAR50D
N	4E	D5	PAR60D
O	4F	D6	PAR70D

Table 2-5 Parameter address first byte

2.1.3.2 Print Output to a Centrally Connected Printer

Structure of message header

Display ISO 7-bit EBCDIC	@ 40 7C	ESC 1B 27	SP 20 40	a 61 81	PAD1	@ 40 7C	KAN	@ 40 7C	1 31 F1	S 53 E2	@ 40 7C	X	X	X	! 21 5A
	NBZ	Parameter announcer			PAR address		Parameter entries								Termin-ation char.

ESC 1B 27	SP 20 40	a 61 81	H 48 C8	@ 40 7C	Q 51 D8	X	X	@ 40 7C	@ 40 7C	X	X	X	! 21 5A	TEXT
Parameter announcer			PAR address		Parameter entries								Termin-ation char.	

Fig. 2-7 Structure of message header for print output to a centrally connected printer

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

PAD1: Parameter address first byte

Displ.	ISO 7-bit	EBCDIC	PARAMETER
I	49	C9	PAR10D
J	4A	D1	PAR20D
K	4B	D2	PAR30D
L	4C	D3	PAR40D
M	4D	D4	PAR50D
N	4E	D5	PAR60D
O	4F	D6	PAR70D

Table 2-6 Parameter address first byte

KAN: Values for channel address

For connection to 8170 LCC, 8171 RCC, 9155 CC (without program YQUER in PDN)

Address LCC and RCC	EBCDIC	40	7F	5B	50	4D	5C	6B	4B	F0	F2	F4	F6	F8	7A	4C	6E	5A	7B	6C	7D	5D	4E	60	61	F1	F3	F5	F7	F9	5E	7E	6F
	ISO-7	20	22	24	26	28	2A	2C	2E	30	32	34	36	38	3A	3C	3E	21	23	25	27	29	2B	2D	2F	31	33	35	37	39	3B	3D	3F
Address CC	EBCDIC	40	5A	7F	7B	5B	6C	50	7D	4D	5D	5C	4E	6B	60	4B	61	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	7A	5E	4C	7E	6E	6F
	ISO-7	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
Channel		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Table 2-7 Values for channel address

The channel is defined by the connection of the printer to the cluster controller.

For connection to BAST, 8171 RCC, 9155 CC of a TC/CFEP/FEP with the program YQUER:

Definition of a printer as the receiving printer for the central output is effected during generation and is controlled by the program YQUER.

Example

> KAN = X'20' (ISO 7-bit) means that the first printer provided for central output is addressed.

2.1.3.3 Print Output to another Locally Connected Printer

Only possible for connection to BAST, 8171 RCC, 9155 CC of a TC/CFEP/FEP with the program YQUER:

Structure of message header

Display ISO 7-bit EBCDIC	@ 40 7C	ESC 1B 27	SP 20 40	a 61 81	PAD1	@ 40 7C	KAN	@ 40 7C	1 31 F1	S 53 E2	@ 40 7C	X	X	X	! 21 5A
	NBZ	Parameter announcer			PAR address		Parameter entries								Termination char.

ESC 1B 27	SP 20 40	a 61 81	H 48 C8	@ 40 7C	Q 51 D8	X	X	@ 40 7C	@ 40 7C	X	X	X	! 21 5A	TEXT
Parameter announcer			PAR address		Parameter entries								Termination char.	

Fig. 2-8 Structure of message header for print output to another locally connected printer

NBZ: **Start-of-message character** indicates whether a message header follows and how long it is.

X: Byte is not evaluated. Standard content is "@" (ISO X'40' or EBCDIC X'7C').

PAD1: Parameter address first byte

Displ.	ISO 7-bit	EBCDIC	PARAMETER
I	49	C9	PAR10D
J	4A	D1	PAR20D
K	4B	D2	PAR30D
L	4C	D3	PAR40D
M	4D	D4	PAR50D
N	4E	D5	PAR60D
O	4F	D6	PAR70D

Table 2-8 Parameter address first byte

KAN: Value for channel address

Definition of a printer as the receiving printer for the central output is effected during generation and is controlled by the program YQUER.

Example

KAN = X'20' (ISO 7-bit) means that the first printer provided for central output is addressed.

2.2 Acknowledgments

2.2.1 Acknowledgments from a DDT with Locally Connected Printer

Positive Acknowledgment

A positive acknowledgment means that the message identified by RB1 and RB2 has been printed in its entirety.

Structure of positive acknowledgment:

Display ISO 7-bit EBCDIC	A 41 C1	RB1	RB2	STB
	NBZ	Parameter entries		

Fig. 2-9 Structure of positive acknowledgment

Negative Acknowledgment

A negative acknowledgment means that the message identified by RB1 and RB2 has **not** been printed in its entirety.

Structure of negative acknowledgment:

Display ISO 7-bit EBCDIC	B 42 C2	RB1	RB2	STB
	NBZ	Parameter entries		

Fig. 2-10 Structure of negative acknowledgment

STB: Status byte

The status byte provides information on the status of the printer.

The exact meanings of the status bits are printer-dependent and are described in the relevant printer manuals.

2.2.2 Acknowledgments from a Centrally Connected Printer

Power Failure Acknowledgment

After powering-on and after a voltage drop, the printer issues a power failure acknowledgment.

Structure of the power failure acknowledgment:

Display ISO 7-bit EBCDIC	C 43 C3	NUL 00	NUL 00	NUL 00	NUL 00
	NBZ	Parameter entries			

Fig. 2-11 Structure of power failure acknowledgment

Positive Acknowledgment

A positive acknowledgment means that the message identified by RB1 and RB2

- has been printed in its entirety (line printer)
- has been sent in its entirety to the printer (page printer).

Structure of positive acknowledgment:

Display ISO 7-bit EBCDIC	A 41 C1	RB1	RB2	STB
	NBZ	Parameter entries		

Fig. 2-12 Structure of positive acknowledgment

Negative Acknowledgment

A negative acknowledgment means that the message identified by RB1 and RB2 has **not**

- been printed in its entirety (line printer)
- been sent in its entirety to the printer (page printer).

Structure of negative acknowledgment:

Display ISO 7-bit EBCDIC	B 42 C2	RB1	RB2	STB
	NBZ	Parameter entries		

Fig. 2-13 Structure of negative acknowledgment

STB: Status byte

The status byte provides information on the status of the printer.

The exact meanings of the status bits are printer-dependent and are described in the relevant printer manuals.

A Appendix

A.1 Table of Functions for Data Display Terminals

Function	Section		97. Data Display Terminal						
		4x	50	52	55	56	58	62	63
Operation with message header 1)	1.1.1	x	x	x	x	x	x	x	x
Message section with PAG	1.2.1	x	x	x	x	x	x	x	x
Message section with structured commands	1.2.2								
LSID	1.2.2.1					x	x	x	x
LPBE	1.2.2.2					x	x	x	x
LZEG	1.2.2.3								x
DEBS	1.2.2.4								x
RDSS	1.2.2.5								x
SRBR	1.2.2.6								x
Query / Query reply	1.2.8						x	x	x
Mess.sect. with position. command	1.2.3	x	x	x	x	x	x	x	x
Message section with FTZ	1.2.4	x	x	x	x	x	x	x	x
Mess.sect. with field & char.atts	1.2.5								x
Mess.sect. with device functions	1.2.6/7								
Cursor positioning operations	1.2.7	x	x	x	x	x	x	x	x
Text manipulation functions	1.2.7	x	x	x	x	x	x	x	x
Erase functions	1.2.7	x	x	x	x	x	x	x	x
Data transmission functions	1.2.7								
DÜ1, DÜ2, K1 - K14, F1 - F20	1.2.7	x	x	x	x	x	x	x	x
F21 - F24	1.2.7					x	x	x	x
Data exchange DDT and centrally connected printer (LAx)	1.2.7	x	x	x	x	x	x	x	x
Programmable key functions	1.2.7	x	x	x	x	x	x	x	x
Special functions	1.2.7	x	x	x	x	x	x	x	x
Output of a system message									
with up to 48 DCCs		x	x	x					
with up to 80 DCCs					x	x	x	x	x
Operation with MCR		x	x	x	x	x	x	x	x
CKT connection	1.2.9								x

1) The use of message headers during data output is not permitted for new applications.

A.2 Code Tables

A.2.1 EBCDI Code (International Version)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0	NUL	DLE			SP	&	-									0	0
1	SOH	DC1					/		a	i			A	J		1	1
2	STX	DC2		SYN					b	k	s		B	K	S	2	2
3	ETX	DC3							c	l	t		C	L	T	3	3
4									d	m	u		D	M	U	4	4
5	HT		LF						e	n	v		E	N	V	5	5
6		BS	ETB						f	o	w		F	O	W	6	6
7	DEL		ESC	EOT					g	p	x		G	P	X	7	7
8		CAN							h	q	y		H	Q	Y	8	8
9		EM							i	r	z		I	R	Z	9	9
A					`	!	^	:									A
B	VT				.	¬	,	#				[				{	B
C	FF	IS4		DC4	<	*	%	@				\					C
D	CR	IS3	ENQ	NAK	(	)	_	'				]				}	D
E	SO	IS2	ACK		+	;	>	=									E
F	SI	IS1	BEL	SUB	|		?	"								¬	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

Example

The letter 'A' has the coding 'C1' (EBCDIC).

A.2.2 EBCDI Code (German Version)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0	NUL	DLE			SP	&	-									0	0
1	SOH	DC1					/		a	j			A	J		1	1
2	STX	DC2		SYN					b	k	s		B	K	S	2	2
3	ETX	DC3							c	l	t		C	L	T	3	3
4									d	m	u		D	M	U	4	4
5	HT		LF						e	n	v		E	N	V	5	5
6		BS	ETB						f	o	w		F	O	W	6	6
7	DEL		ESC	EOT					g	p	x		G	P	X	7	7
8		CAN							h	q	y		H	Q	Y	8	8
9		EM							i	r	z		I	R	Z	9	9
A					`	!	^	:									A
B	VT				.	$	,	#				Ä				ä	B
C	FF	IS4		DC4	<	*	%	§				Ö					C
D	CR	IS3	ENQ	NAK	(	)	_	'				Ü				ü	D
E	SO	IS2	ACK		+	;	>	=									E
F	SI	IS1	BEL	SUB	ö		?	"								ß	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

Example

The letter 'A' has the coding 'C1' (EBCDIC).

A.2.3 ISO 7-Bit Code (International Version)

	0	1	2	3	4	5	6	7	
0	NUL	DLE	SP	0	@	P	`	p	0
1	SOH	DC1	!	1	A	Q	a	q	1
2	STX	DC2	″	2	B	R	b	r	2
3	ETX	DC3	#	3	C	S	c	s	3
4	EOT	DC4	a	4	D	T	d	t	4
5	ENQ	NAK	%	5	E	U	e	u	5
6	ACK	SYN	&	6	F	V	f	V	6
7	BEL	ETB	′	7	G	W	g	w	7
8	BS	CAN	(	8	H	X	h	x	8
9	HT	EM	)	9	I	Y	i	y	9
A	LF	SUB	*	:	J	Z	j	z	A
B	VT	ESC	+	;	K	[	k	{	B
C	FF	IS4	,	<	L	\	l	|	C
D	CR	IS3	–	=	M	]	m	}	D
E	SO	IS2	.	>	N	^	n	|	E
F	SI	IS1	/	?	O	_	o	DEL	F
	0	1	2	3	4	5	6	7	

Example

The letter 'A' has the coding '41' (ISO 7-Bit code).

A.2.4 ISO 7-Bit Code (German Version)

	0	1	2	3	4	5	6	7	
0	NUL	DLE	SP	0	§	P	`	p	0
1	SOH	DC1	!	1	A	Q	a	q	1
2	STX	DC2	"	2	B	R	b	r	2
3	ETX	DC3	#	3	C	S	c	s	3
4	EOT	DC4	$	4	D	T	d	t	4
5	ENQ	NAK	%	5	E	U	e	u	5
6	ACK	SYN	&	6	F	V	f	v	6
7	BEL	ETB	’	7	G	W	g	w	7
8	BS	CAN	(	8	H	X	h	x	8
9	HT	EM	)	9	I	Y	i	y	9
A	LF	SUB	*	:	J	Z	j	z	A
B	VT	ESC	+	;	K	Ä	k	ä	B
C	FF	IS4	,	<	L	Ö	l	ö	C
D	CR	IS3	–	=	M	Ü	m	ü	D
E	SO	IS2	.	>	N	^	n	ß	E
F	SI	IS1	/	?	O	_	o	DEL	F
	0	1	2	3	4	5	6	7	

Example

The letter ’A’ has the coding ’41’ (ISO 7-bit code).

A.2.5 Meaning of Control Characters in Code Tables

NUL	fill character
SOH	start of heading
STX	start of text
ETX	end of text
EOT	end of transmission
ENQ	enquiry
ACK	acknowledge
BEL	bell
BS	backspace
HT	horizontal tabulation
LF	line feed
VT	vertical tabulation
FF	form feed
CR	carriage return
SO	shift-out
SI	shift-in
SP	space
DLE	data link escape
DC1	device control character 1
DC2	device control character 2
DC3	device control character 3
DC4	device control character 4
NAK	negative acknowledge
SYN	synchronous idle
ETB	end-of-transmission block
CAN	cancel
EM	end of medium (end marker)
SUB	substitute
ESC	escape
IS4	information separator 4
IS3	information separator 3
IS2	information separator 2
IS1	information separator 1
DEL	delete

A.3 Conversion Tables

A.3.1 EBCDIC → ISO 7-Bit Code

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0	00	10			20	26	2D									30	0
1	01	11					2F		61	6A			41	4A		31	1
2	02	12		16					62	6B	73		42	4B	53	32	2
3	03	13							63	6C	74		43	4C	54	33	3
4									64	6D	75		44	4D	55	34	4
5	09		0A						65	6E	76		45	4E	56	35	5
6		08	17						66	6F	77		46	4F	57	36	6
7	7F		1B	04					67	70	78		47	50	58	37	7
8		18							68	71	79		48	51	59	38	8
9		19							69	72	7A		49	52	5A	39	9
A					60	21	5E	3A									A
B	0B				2E	24	2C	23				5B				7B	B
C	0C	1C		14	3C	2A	25	40				5C					C
D	0D	1D	05	15	28	29	5F	27				5D				7D	D
E	0E	1E	06		2B	3B	3E	3D									E
F	0F	1F	07	1A	7C		3F	22								7E	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

A.3.2 ISO 7-Bit Code → EBCDIC

	0	1	2	3	4	5	6	7	
0	00	10	40	F0	7C	D7	4A	97	0
1	01	11	5A	F1	C1	D8	81	98	1
2	02	12	7F	F2	C2	D9	82	99	2
3	03	13	7B	F3	C3	E2	83	A2	3
4	37	3C	5B	F4	C4	E3	84	A3	4
5	2D	3D	6C	F5	C5	E4	85	A4	5
6	2E	32	50	F6	C6	E5	86	A5	6
7	2F	26	7D	F7	C7	E6	87	A6	7
8	16	18	4D	F8	C8	E7	88	A7	8
9	05	19	5D	F9	C9	E8	89	A8	9
A	25	3F	5C	7A	D1	E9	91	A9	A
B	0B	27	4E	5E	D2	BB	92	FB	B
C	0C	1C	6B	4C	D3	BC	93	4F	C
D	0D	1D	60	7E	D4	BD	94	FD	D
E	0E	1E	4B	6E	D5	6A	95	FF	E
F	0F	1F	61	6F	D6	6D	96	07	F
	0	1	2	3	4	5	6	7	

Example

Conversion: ’41’ (ISO 7-bit code); ’C1’ (EBCDIC).

Abbreviations

AD1/2	address 1/2
ADA	print command
AM	beginning marker
ATAB	automatic tabulator
AUSG	program revision level
AWL	ID card reader
AZP	indicator line
BAM	bit-serial asynchronous multipoint line protocol
BAST	controller for BAM lines
BLI	flash, blink
CC	cluster controller
CDS	code for send keys
CFEP	compact front-end processor
CKT	chip card terminal
CPU	computer
CR	carriage return
DCC	display control character
DCE	data circuit-terminating equipment
DCM	Data Communication Methods
DDT	data display terminal
DDT-C	data display terminal for cluster connection
DDT-S	data display terminal for standalone connection
DEAA	define display attribute
DEBS	define screen
DEFA	define color attributes
DEZS	define font
DRU	printable
DÜ	data transmission, data communication
EA	selecting
EBCDIC	Extended Binary-Coded Decimal Interchange Code
EM	end marker
ESC	Escape
EZFA	create field attributes
FAT	field attribute
FAZ	reset field separator to initial state
FB	field mode
FEM	error message
FEP	front-end processor
FEPR	remote front-end processor
FHC	field handling character
FHS	Format Handling System
FST	function control character
FTZ	field separator
GEF	device function
GEF1/2	device function 1/2
GNU	protected non-transmittable
GÜ	protected transmittable
HKT	hybrid card terminal
ID1/2	identification character 1/2

IE	interface expander
IFEP	integrated front-end processor
ISO	International Organization for Standardization
ISx	information separator
ITC	integrated terminal controller
KAN	channel address
KR	communication computer
LAP1	LA functions parameter
LAx	local initiation (printer)
LCC	local cluster controller
LOGZEG	logical character generator (symbolic name for ZEG)
LPBE	read P-areas
LSID	read SIDATA parameters
LZE	logical end of line
LZEG	load character generator
MAR	markable
MCR	magnetic card reader, ID card reader
MOD	modification
MOFA	modify field attributes
MSC	medium-speed concentrator
MSV1	procedure: Medium Speed Variant 1
MULTIKOS	multi-component terminal support
NBZ	start-of-message character
NT	message text
NUM	numeric
PA	parameter area
PAG	parameter entries
PAK	parameter announcer
PAR	parameter
PBH	parameter handling
PCC	Protocol Converter Concentrator
PDN	program system for teleprocessing and network control
PHYZEG	physical character generator
PLUS	load and store program keys
PS	parameter segment
RB1/2	return bytes 1/2
RCC	remote cluster controller
RDSS	reset screen
RM	acknowledgment
RS	reset
RSZA	reset character attribute
RU	roll-up
RUB	roll-up mode
SA	polling
SAW	send command
SMF	cursor function
SP	Space
SPA	column address
SRBR	write display area
SS	interface
STA	structured command
STB	status byte
STZ	physical control character
TC	terminal computer

TI	text identifier
TID	terminal identification
TIL	text identification length
TKL	text header length
UNT	underscored
WAR	queue identifier
ZAT	character attribute
ZEG	character generator
ZLA	line address
ZZx	status character

References

[1] TRANSDATA
Data Display Terminals
Functional Descreption

Target group
Programmers

Contents
- Functional characteristics and hookup of DDTs
- Intercommunication of DDTs
- Message format for DDT communication
- Operation of printers hooked-up to DDTs

Applications
Application software programming

[2] **TRANSDATA Product Overview**

Ordering manuals

The manuals listed above and the corresponding order numbers are to be found in the *List of Publications: Data Systems*, which also tells you how to order manuals. New publications are listed in the *Druckschriften-Neuerscheinungen Datentechnik (New Publications)*.

You can arrange to have both of these sent to you regularly by having your name placed on the appropriate mailing list. Your local Siemens office will help you.

Index

acknowledgments 2-11

base parameter 1-7
BLI bit 1-16

character attribute 1-45
code
– extension character 1-7
– tables A-2
color attribute 1-46
column address 1-35
configuration 1-67
control characters, meaning in code tables A-6
conversion tables A-7
CPU 1-8
cursor positioning functions 1-52

data
– input 1-2
– output 1-1
– transmission functions 1-60
define screen 1-30
device functions 1-50
display
– area 1-76
– attribute 1-45
– characteristics 1-38, 1-40, 1-47, 1-48
– control characters 1-38

EBCDI
– code, German version A-3
– code, international version A-2
EBCDIC → ISO 7-bit code A-7
erase functions 1-58
error
– code 1-33
– message 1-32
– messages 1-6

field attribute 1-40, 1-43, 1-44
– 1 1-40
– 2 1-41
– 3 1-41
– 4 1-41
– characteristics 1-36, 1-41
– handling characters 1-36, 1-37
– separator 1-36
font 1-49
format mode 1-15

hardcopy mode 2-3, 2-6

ISO 7-bit code
– → EBCDIC A-8
– German version A-5
– international version A-4

line address 1-34
load character generator 1-27

message
– header 1-1, 1-2
– prefix 1-1
– structure 2-1
– text 1-1
MOD bit 1-16
monitor 1-71

P-areas 1-26
PAR
– 00D 1-22
– 00E 1-3
– 00L 1-9
– 01E 1-5
– 01L 1-17
parameter
– announcer 1-7
– area 1-8
– areas 1-7
– entries 1-1
– segment 1-7, 1-8
positioning commands 1-34
printer operation 2-1
program version 1-74
programmable key functions 1-62

query 1-66
– reply 1-67

reset screen 1-31

SIDATA parameters 1-25
special functions 1-63
start-of-message character 1-1, 1-7
structured commands 1-25

text manipulation functions 1-54

unsolicited print output 2-1

write display area 1-31

From

Name ....

Company ....

Street ....

City/Postal Code ....

Phone ....

Date ....

To
Siemens AG

DI ST QM 2
Manualredaktion

Otto-Hahn-Ring 6
8000 München 83

Reader's Reply Form

TRANSDATA Data Display Terminals
Code Tables
User's Guide
Edition July 1990

Page	Criticisms / Suggestions / Corrections

Page	Criticisms / Suggestions / Corrections

From

Name ....

Company ....

Street ....

City/Postal Code ....

Phone ....

Date ....

To
Siemens AG

DI ST QM 2
Manualredaktion

Otto-Hahn-Ring 6
8000 München 83

Reader's Reply Form

TRANSDATA Data Display Terminals
Code Tables
User's Guide
Edition July 1990

Page	Criticisms / Suggestions / Corrections

Page	Criticisms / Suggestions / Corrections